Records Arithmetick

OR,

OF ARTS: Beter Nish

TEACHING

The perfect work and practice of Arithmetick, both in whole Numbers and Fractions, after a more easie and exact forme then in former time hath been set forth: Made by M. Robert Record, D. in Physick.

Afterwards, augmented by M. John Dee.

And fince enlarged with a third part of Rules of Practife, abridged into a briefer method then hitherto hath been published, necessary Rules incident to the Trade of Merchanh Tables of the valuation of all Coynes, as they are currant at this present time.

By Fobn Mellis.

And new iligently perused, corrected, illustrated and enlarged; with an Appendix of figurate Numbers, and the Extraction of their Roots according to the method of Christian V residue: with Tables of Board and Timber measure; and new Tables of Interest upon Interest after 10 and 8 per 1003 with the true value of Annuities to be bought or sold present, Respited, or in Revession; the first calculated by R. C. but corrected, and the latter diligently calculated by Ro. Hartwell, Philomathemat.

Scientia non bubet inimicum nisi ignorantem
Fide Vide.

LONDON

Printed by M. F. for John Harison, and are to be fold by Nath. Brooks, at the signe of the Angell in Corn-hill.

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To the Most mighty Prince, Edward the sixth, by the grace of God, King of England, France, and Ireland, &c.

He Excellency of mans nature being fuch, as it is by Gods divine favour (most mighty Prince) not only created in highnesse of degree far above all other corporall things, but by perfection, reason, and search of wit, much

approaching toward the image of God, as not onely the holy Scriptures do testifie, but also those naturall Philosophers, which exactly did consider the nature of man, and namely the far reach and infinite compasse of the words of the mind, were inforced to confesse, that man scarcely was able to know himself. And if he would duly ponder the nature of himself, he would find it so strange, that it might seem unto him a very miracle: And thereof sprang that saying; Magnum miraculum est homo, maximum miraculum sapiens bomo. For undoubtedly, as man is one of the greatest miracles that ever God wrought, so a wise man is plainly the greatest.

And therefore was it that some did account the head of a man the greatest miracle in the world, because not only of the strange workmanship that is in it, but much more of the esseate of reason, wit, memory, imagination, and such other powers, and works of the mind, which can more easily conceive any thing in a manner then understand it self. Amongst all the creatures of God, it sindeth none more dissiple to be perceived then these same powers of it self; whereby it doth sonceive and judge: as it may be well conjectured by the diversity of opinions, that the wisest Philosophers did utter touching the spirit of man, and the substance of it: whereof I now intend to make he rehearfall; but who so listeth to read thereof, may find it largely

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fer forth, not onely in Aristotle his books de Anima, but also in Galen his book called Historia Philosophica: and again in Plutarch his work, De Philosophoru placetis, whose words are also repeated of Eufebius in the xv. book, This doay yearning aggragations, unto whom I remit them that have defired to understand intricate difficulty of knowing our own selves, as touching our best part, and that part whereby we

deferve to bear the name of men.

This matter seemed to obscure and difficult in knowledge; that Galen, who for his excellent wifdom and judgement in naturall works, is called of many men a Miracle in Nature yet in fearthing the nature and substance of the spirit of man, he not onely confesfeth himself ignorant, but counteth it plain temerity to attempt to find it. So far above the hope of mans knowledge is that part, whereby man doth know and judge of things. And although the ignorant fort (which hate all things that they know not) do little effect the profoundoes of mans spirit and reason, the chief power and faculty of it: yet as there is a kind of fear and obedience of unreasonable beasts unto man, by the working power of God, so is there in those small reafoned persons a certain kind of reverence toward wisdom and reason, which they do shew oftentimes, and by power of perswasion, are inforced to obey reason, will they nill they: And hereby came it to passe, that the rudenesse of the first age of man was brought unto some more civill trade, as it is well declared by Cicero, in the beginning of his first book, De Inventione Rhetorica, where he faith thus. Nam fuit quoddam tempus quum in agris homines passim bestiarum more vagabantur, & sibi victu ferino vitam propagabant, necratione animi quicquam, sed pleraque viribus corporis administrabant. Nondum divina religienis, non humani ratio colebatur. Nemo legitmas viderat nuptias, non certos quisquam inspexeratliberos; non jus aquabile quidutilitatis haberet, acceperat: ita propter errorem atque insatiam caes ac temeraria dominatrix animicupiditas, ad se explendam viribus corporis abutebatur perniciosissimis satellitibus. Quo tempore quidam, magnus videlicet vir & sapiens, cognovit que materia esset, e quanta ad maxmas res opportunitas in animis inesset bominum, si quis eam possiit clicere, & pracipiendo meliorem reddere. Qui dispersos bomines in Agris, & in testis Sylvestribus abditos, ratione quadam compulit in unum locum, & congregavit: & eos in unamquamque rem inducens utilem atque bonestam, primo propter insolentiam reclamantes, deinde propter rationem atque orationem studiosius audientes, ex feris & immanbus, mites reddidit, & mansuetos.

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This long repetition of Tullyes words will feem tedious to them that love but little, and care much leffe for the knowledge of reason, but unto your Majesty (I dare say) it is a delectable remembrance, and unto me it seemed so pleasant, that I could scarce stay my pen from writing all that mine eyes did so greedily read.

This sentence of Cicero am I loath to transate into English; partly for that unto your Majesty it needeth no translation, but especially knowing how far the grace of Tullyes eloquence doth excell any Englishmans rongue, and much more exceedeth the basenesse of my barbarous stile: yet for the fruit of my sentence, I had rather unto my meer English Country men utter the rudenesse of my translation, then to defraud them the benefit of fo good a leffon truffing they will so learn to love reason, that they will also gladly and greedily embrace all good Sciences, that may help to the just furniture of the same, when they consider that informed reason was the only instrument, or at least the chiefest meanes to bring men into civil regiment, from barbarous manners, & beaftly conditions. "For the time was (faith Tully) that men wandred "abroad in the fields up and down like beafts, and "suled no better order in feeding then they : fo that "by reasons rule they wrought nothing, but most of their doings did they atchieve by force of strength.

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"Archis time there was no just regard of religion towards God, nor of duty toward man, No man had er feen right use of marriage, neither did any man know their own children from other; nor no man "had felt the commodity of just Laws: to that through error and ignorance, wilfull luft, like a blind and " heady ruler, abused bodily strength as a most mortall minister for the satisfying of his defire. At that " time was there one which not onely in power, "but also in wisdome was great, and he confidered thow that in the minds of men was both apr inftru-"ments, and great occasion to the due accomplish-" mene of most weighty affairs, if a man could apply them to use, and by reaching of rules frame them to better trade, This man with perswasion of reason " gathered into one place the people that were wan-" dring about the fields and lay lurking in wild cotta-"ges, and woods, and bringing them into one com-" mon fociety ,did trade them to all fuch things, as " either were profitable or honest, although not with-" out repining at the first, by reason than they had not been fo accultomed before: Yet at length through "reason and perswasion of words they obeyed him " more diligently, and fo of a wild and cruell people, " he made them courteous and gentle.

Thus hath Tully set forth the efficacy of reason and perswassion, how it was able to convert wild people to a mildnesse, and to change their furious cruelnesse into gentle courtesse: were it not now a great reproach in this our time (when knowledg reignesth so large) that men should shew themselves lesse obsequious to reason? Valesse it may be thought, that now every man having sufficient knowledge of himself, needeth not

to hearken to the perswasson of others,

Indeed he that thinketh himself wife, will not esteem the reason of any other, be he never so wise; so that of such a one it may well be said : He that thinketh himself wifer then he is, may justly be counted a dou-

the Kings Majeftie.

ble fool. Wherefore fuch men are not to be permitted in open audience to talk, but must be purto filence, and be made to give ear to reason; which reason confifteth not in a multirude of words heaped rafhly together, and applied for one purpole, but reason is the exprefling of a just matter with witty perswasions, furnithed with learned knowledge: fuch knowledge had Moles, being expert in all learning of the Agyptians, as the Scriptures declare, and therefore was able to perswade the stubborn people of the Jews, although not without pain. Such knowledge, and fuch reasons did Drays shew, which was the first Law-maker of all Drays was the West part of Europe. Like reason and wisdom did son to king Xamolxis amongst the Goths. Lycurgus unto the La- Sarron, and cedemonians. Zelencus to the Locrians. Solon to the succeeded Athenienses, and Dunwallo Molmutius two thousand him in his yeers past amongst the old Britains of this Realm. And kingdome. hereby came it to paffe, that their Laws continued long, till more perfect reason altered many of them. and wilfull power oppressed most of them.

At the beginning when these wise men perceived how hard it was to bring the rude people to understand reason, they judged the best means to attain this honest purpose, to depend of learning in every kind : for by learning (as Ovid faith) Pectora mollescent asperitasque' fugit, Stout stomacks do wax milde and tharp fierceneffe is exilde. Therefore as Berofus doth teftifie, Sarron that was the third King over all this West part of Europe, for to bring the people from beattly rage to manly reason, did erect Schools of liberall Arts, which took fo good fuccesse, that his name continued in that fort famous above two thousand yeers after: for Diodorus Siculus which was in the time of Julius Cafar, maketh mention of the learned men or Gothes of Celtes, and nameth them Sarrowides, that is to say, Sarron his Scholars and followers.

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Among these Arts that then were taught, some did inform

inform the tongue, and make them able both to utter aprly their mind, and also to perswade; as Grammar. Logick, and whetorick, although not fo curiously as in this time; some other did appertain to the just order of partition of Lands, the true using of Weights, Meafures and reckonings in all forts of bargains, and for order of building and fundry other uses; those were Arithmetick and Geometry, Again, to incourage men to the honour of God, they taught Aftronomy, wherby the wonderfull works of God were so manifestly set forth, that no mans tongue, nor pen can in like fort expresse his infinite power, his unspeakable wisdome, and his exceeding goodnesse toward man, whereby he doth bountifully provide for man all necessaries, not onely to live, but also to live pleasantly. And so was their confidence in Gods providence strongly stayed, knowing his goodnesse to be such, that hee would help man as hee could, and his power to be fo great, that he would do nothing but that that was belt. Beside these Sciences they taught also Musick, which most commonly they did apply partly to religious fervices, to draw men to delight therein, and partly to fongs made of the manners of men, in praise of Vertue and discommendation of Vice, whereby it came to pa lle, that no man would displease them, nor do any thing evill that might come to their hearing : for their fongs did make evill men more abhorred in that time then any excommunication doth in this time. The posterity of these Musicians continue yet both in Wales and Ireland, called Bardes unto this day, by the ancient name of Bardus, their first founder,

This Bardus Druydius the 5. Kingof the

Celtes.
And as these Sciences did encrease, so did virtue enreigned 60 crease thereby. Again, as those Sciences did decay, so
years, and Vertue lost her estimation, and consequently was little
died 1832 in use: whereof to make a full reclartion were a
years be thing meet for a Prince to hear, but it would require a
fore Christ peculiar Treatise. Wherefore at this present I count

is fufficient lightly to have touched this matter in generall words, and to fay no more of the particularity thereof, but onely touching one of those Sciences, that is Arithmetick, by which not onely just partition of lands was made, but also touching buying and felling, all Affifes. Weights, and Measures were devised, and all reckonings and accounts driven; yea by proportion of it were the true orders of luftice limited, as Aristotle in his Ethicks doth declare, and the degrees of effates in the Common wealth established; although that proportion be called Geometricall, and not Arithmeticall, yet doth that proportion appertain to the art of Arithmetick, and in Arithmetick is taught the progreffion of fuch proportions, and all things thereto belonging. Wherefore I may well fay that iceing Arithmetick is so many wayes needfull unto the first planting of aCommon-wealth, it must needs be as much required to the preservation of it also: for by the same meanes is any Common-wealth continued, by which is was erected and established. And if I shall in small matters in appearance, but indeed very weighty, put one example or two. What shall we say for the Statutes of this Realm, which be the onely stay of good order in manner now? As touching the measuring of ground by length and breadth, there it a good and an ancient Statute made by art of Arithmetick; and now it shall be to little use, if by the same Art it be not Prachifed and tried. For the affile of Bread and Drink, the two most common and most necessary things for sustentation of man, there was a goodly ordinance in the Law made, which by ignorance hath so grown out of knowledge, and use, that few men do understand it. and therefore the Statute books wonderfully corrupted, and the Commons cruelly oppressed : notwithhanding some men have written that it is too doubtfull a matter to execute those affises by those Statutes, by reason they depend of the standard of the covne, which

which is much changed from the state of that time, when those Statutes were made. Thus shall every man read statutes were made. Thus shall every man read statutes in the Abridgement of the Statutes, in the title of Weights and Measures, in the seventh number of the English Book, where he should have translated a good ordinance which is set forth in the French Book: but no marvell if the Abridgement doth omit it, seeing the great Book of Statutes doth omit the same Statute, as it hath done divers other very good Lawes. And this is the fruit of ignorance, to reject and condemn all that it understandeth not, although they use some cloaks for it: but such cloaks as being allowed, might serve to repell all good Laws; which God forbid.

Againe, there is an ancient order for affile of fire, Wood and Coals, which was renued not many years past; and now how avarice and ignorance doth canvale that Statute at is too pitifull to talk of, and more

miserable to feel.

Furthermore, for the Statute of Coynage, and the standard thereof, if the people understood rightly the Statute, they should not, nor would not (as they often do) gather an excuse for their folly thereby : but as I faid, thefe Statutes by wisdome and good knowledg of Arithmetick were made, and by the same must they be continued. And let ignorance no more meddle with the use of them, then it did with the making of them. Oh in how miferable case is that Realm, where the ministers and interpreters of the Law are destitute of all good Sciences, which be the Keys of the Laws! How can they either make good Laws, or maintain them that lack that true knowledge whereby so judge them? And happy may that Realm be accounted, where the Prince himself is studious of learning, and defireth to understand equity in all Laws. Therefore most happy are we the loving subjects of your Majeffy, which may fee in your Highnesse not onely

onely fuch sowardnesse, but also fuch knowledge of . divers Arts, as feldom hath been feen in any Prince of fuch years, whereby we are enforced to conceive this hope certainly, that he which in those years feeketh knowledge, when knowledge is least ofteened, and of fuch an age can difcern them to bee enemies both to his Royall Person and to his Realms, which labour to withdraw him from knowledg to excellive paftime, and from reasonable study to idle or novsome pleasures, he must needs when he cometh to more mature years, be a most prudent Prince; a most just Governour, and a right ludge, not onely of his Subjects commonly, but also of the ministers of his Laws, yea. and of the Laws themselves : and to bee able to conceive the true equity and exact understanding of all his Laws and Statutes, to the comfort of his good Subices, and the confusion and reproach of them which labour to obscure or pervert the equity of the same Laws and Statutes. How some of these Statutes may be applied to use, as well in this our time, as in any other time, I have peculiarly declared in this Book and some other I have omitted for just considerations, till I may offer them first unto your Majesty to weigh them as to your Highnesse shall seem good: for many things in them are not to be published without your Highnesse knowledge and approbation; namely, because in them is declared all the rates of alloyes for all standards from one ounce upward, with other mysteries of Mint matters, and also most part of the varieties of coynes that have been currant in this your Majesties Realm by the space almost of fix hundred years last past, and many of them that were currant in the time that the Romanes ruled here.

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ot ly All which, with the ancient description of England and Ireland, and my simple censure of the same, I have almost compleated to be exhibited to your Highnese: In the mean season most humbly beseeching your Ma-

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The Preface unto the Kings, &c.

jesty to accept this simple Treatise, not worthy to be presented to so high a Prince, but that my lowly request to your Majesty is that this amongst other of my Books may passe under the protection of your Highnesse, whom I beseech God most earnestly and daily, according to my duty, to advance in all honour, and Princely Regalty, and to increase in all knowledge, justice, and godly policy. Amen,

Your Majesties most obedient subject and servant,

ROBERT RECORD.

TO

TO THE LOVING READERS, The Preface of Mr. Robert Record.

Sore of times have I lamented with my selfe the unfortunate condition of England, seeing so many great Clerks to arise in sundry other parts of the world, and so seem to appear in this our Nation: whereas for pregnancy of natural wit (I think) sew Nations do excell Englishmen: But I cannot impute the cause to any other thing, then to the contempt, or misregard of learning. For as Englishmen are inserior to no men in mother wit, so they passe all men in vain pleasures, to which they may attain with great pain and labour: and are slack to any never so great commodity, if there hang of it any painfull study or travelsome labour.

Howbeit, yet all men are not of that sort, though the most part be, the more pity it is: but of them that are so glad, not onely with painfull study, and studious pain to attain learning, but also with as great study and pain to communicate their learning to other, and make all England (if it might be) partakers of the same; the most part are such, that unneath they can support their own necessary charges, so that they are not able to beare any charges, in doing of that good

that elfe they defire to do.

But a greater canse of lamentation is this, that when learned men have taken pains to do things for the aid of the unlearned, scarce they shall be allowed for their wel doing but derided and scorned, and so utterly discouraged to take in hand any like enterprise again. So that if any be found (asthere are some) that do favour

learnings

knowledg, yea onely with their word; such persons though they be rare, yet shall they encourage learned men to enterprise something at the least that England may rejoyce of. And I have good hope that England will after she bath taken some sure taste of learning) not onely bring forth more favourers of it, but also such learned men, that she shall be able to compare with any Realmin the world. But in the mean sea-sometic few regarders of learning are, how greatly they are to be esteemed that do favour or further it, my pen will not suffice at full to declare.

Therefore, gentle Reader, whereas I do upon most just occasion judge, yea and know assuredly, that there be some men in this Realm, which both love and also much desire to further good learning, and yet am not well able to write their condign praise for the same, I think it better with silence to overpass it, then either say too little of it, or to provoke against them the malice of such other, which do nothing themselves that is praise-worthy, and therefore cannot abide to hear

the praise of any other mans good deed.

And considering their great favour unto learning, though I my self be not worthy to be reckoned in the number of great learned men, yet am I bold to put my self in Presse, with such ability as God hath lent me, though not with so great cunning as many men, yet with as great affection as any man to help my Country men, and wil not cease dayly, (as much as my small ability will suffer me) to endite some such thing, that shall be to the instruction, though not of learned men, yet at the least of the vulgar sort, whose argument alwayes

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wayes (ball be such as it shall delight all learned wits; though they do not learn any great thing out of it.

But to speake of this present book of Arithmetick, I dare not, nor will not fet it forth with any words, but remit it to the judgement of all gentle Readers, and namely, such as love good learning, befeeching them so to esteem it, as it doth seems worthy. And so either to accept the thing for it felf, either at the least to allow my good endeavour. But I perceive I need not use any perswasions unto the, whose gentle nature and favourable mind is ready to receive thank fully, dinterpret to the best al such enterprises attempted for so good an end, though the thing do not always fatufie mens expectation. This considered, did bolden me to publish abroad this little Book of the Art of numbring, which if you shal receive favourably you shall encurrage me to gratifie you hereafter with Some greater thing.

And as I judge some men of so loving a minde to their native Countrey, that they would much rejoyce to see it prosper in good learning, writty Arts: so I hope well of all the rest of Englishmen, that they will not be unmindfull of his due praise, by whose meanes they are helped and furthered in any thing. Neither ought they to esteem this thing of so little value, as many men of little discretion oftentimes do. For who so setteth small price by the witty device and knowledge of numbring, he little considereth it to be the chief point, (in manner) whereby men disfer from all brute beastes: for as in all other things (almost) beasts are partakers with us, so in numbring we differ clean from them, and in man-

ner peculiarly, fith that in many things they excell us again.

The Fox in crafty wit exceedeth most men, A Dog in faelling hath no man his peer. To forelight of weather if you look then, Many beafts excell men; this is cleer. The wittinesse of Elephants doth letters attain, But what cunning dorh there in the Bee remain? The Emmet foreleeing the hardnesse of winters Provideth victuals in the time of fummer. The Nightingale, the Linet, the Throsh, the Lark, In Musicall harmony passe many a Clark. The Hedghog of Altronomy feemeth to know, and stoppeth his cave where the wind will blow. The Spider in weaving such Art doth show, man can him mend, nor follow I trow. when a house will fall, the Mice right quicke Withence before; can man do the like?

Many things else of the wittinesse of Beasts and Birds might I hear say, save that another time of them I intend to write, wherein they excell in manner all men, as it is daily seen: but in number was there never beast found so cunning, that could know or discern one thing from many, by daily experience you may well consider, when a Bitch hath many whelps, or a Hen many chickens: and likewise of other what seever they be, take from them all their young saving onely one; and you shall perceive plainly, that they misse none, though they will resist you in taking them away, and will seek them agains if they

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may know where they besbut elfe they mil never miffe them truly; but take away that one that is left, and then will they cry and complain; and restore to them that one, then are they pleased again. So that of number, this may I justly fay, it is the onely thing almost that separateth man from beasts. He therefore that shall contemn number, declareth himself as brutish as a beaft, and unworthy to be counted in the fellowship of men. But I trust there is no man so fouleover-seen, though many right smally do it regard.

Threfore will I now stay to write against such, Why the and return again to this my Book, which I have Author Written in the forme of a Dialogue, because I judge Dialogue that to be the easiest way of instruction, when the wife. Scholar may ask every doubt orderly, and the Ma-

ster may answer to his question plainly.

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Howbeit I thinke not the contrary, but as it is enfier to make another muns work thento make the like; so there will be some that will find fault, because I write in a Dialogue : but as I conjecture those shall be such as do not, cannot, or will not perceive the reason of right teaching, and therefore are unmeet to be answered unto, for such men with no reason will bee Surisfied.

And if any man object, that other Books have been written of Arithmetick already fo sufficiently; that I needed not now to put Pen to the Book, except I will condemn other mens writings: To them Land fwer: That as I condemn no mans diligence, so I know that no one man can satisfie every man; and therefore like as many do esteem greatly other Books, so 1 doubt not but some will like this my Book above any other

other English Arithmetick hisberto written; and namely, such as shall lack instructors, for whose sake I have soplainly set forth the Examples, as no Book that I have seen hath done hitberto: which thing shall be great ease to the rude Readers.

Therefore (gentle Reader) though this Book can be but small aid to the learned fort, yet unto the simple ignorant (which needeth most help) it may be a

good furtherance and mean unto knowledge.

And though anto the King his Majesty privately I doe it dedicate, yet I doubt not (such is his clemencie) but that he can be content, yea, and much desirous, that all his loving Subjectsshall take the use of it, and imploy the same to their most prosit. Which thing if I perceive that they thank fully do, and receive with as good will as it was written, then will I shortly with no lesse kindnesse set forth such introductions into Geometry and Cosmography, as I have at times promised, and as hitherto in English hath not been enterprised, wherewith I dare say all honest bearts will be pleased, and all studious with greatly delighted.

I will say no more, but let every man judge as he shall see cause. And thus for this time I will stay my Pen, committing you all to that true fountain of perfect number, which wrought the whole world by number and measure: he is Trinity in Knity, and

glory. Amen.

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Before

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Before the Introduction of Arithmetick, it were very good, to have some understanding and knowledge of these Figures and Notes.

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A Dialogue between the Master and the Scholar: teaching the Art and use of Arithmetick with Pen.

The Scholar Speaketh.



IR, such is your authority in mine estimation, that I am content to conset to your saying. It is reserve it as truth, though I see none other reason that doth lead me there unto: whereas else in mine own conceit it appeareth but

vain, to bestow any time privately in learning of that thing that every childe may, and doth learn at all times and hours, when he doth any thing himself alone, and much more when he talketh or reasoner by withouthers.

Maker. Lo, this is the fathion and chance of all them that feek to defend their blinds ignorance, that when they think they have made trong reals for themselve, then have they probed quite contrary. For if numbring he lo common (as you grant it to be) that no man can bo

ang

any thing alone, and much leffe talk or bargain with other, but be thall Will have to bo with number: this probeth not number to be contemptible & vile, but rather right excellent and of bigh reputation, lith it is the ground of al mens affairs, in that without it no fale can be told, no communication without it can be continued no bargaining without it can bulp be ended. 02 no bulines that man bath justly completed. Thefe commodities if there were none other, are infficient to approve the worthineste of number. But there are other innumerable far palling all thefe, which declare number foer reed all praffe. Wil berefore in all great works are Clerks fo much befired ? Wheretoze are Aubitors fortebly fen? What caufeth Geometricians to bighly to be inhaunted? With are A ftronomers to greatly advanced? Because that by number fach things they finde, which elfe would farre ercell mans minde.

Scholar, Merily, sir, if it be so, that shels men by numbring, their cunning do attain, at whose great works most men do wonder, then I see well I was much deceived, a numbring is a more cunning thing then I took it to be.

Master. If number were so vile a thing as you bid esteem it, then need it not to be used so much in mens communication. Orclude number, and answer to this question: How many years old are you?

Scholar,

ai Io

ts

pa

re

OU

io ibi Scholar. Mum.

Master. Down many dayes in a weeke?
Down many weeks in a year? What lands bath your Father? Down many men both be keep? Down long is it fince you came from bim to me?

Scholar, Mum.

Master. So that if number want, you and swer all by Mummes: how many miles to London?

Scholar. A poak full of plums.

Master. They, thus you may see, what rule number beareth, and that if number be lacking it maketh men dumb, so that to most questions they must answer Mum.

Scholar. This is the cause, sir, that I judged it so vile, because it is so common in talking expert while: Roz plenty is not dainty, as the

common faping is.

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lar,

Master. Po, nor store is no sore, perceive you this? The more common that the thing is, being needfully required, the better is the thing, and the more to be desired. But in numbring as some of it is light and plain, so the most part is difficult and not easie to attain. The easier part serbeth all men in common, and the other requireth some learning. Wherefore as with out numbring a man can to almost nothing, so with the help of it you may attain to all bings.

Scholar. Dea, fir, why then it were best to learn

learn the Art of numbring, first of all other learning, and then a man need learn no more if all other come with it.

Mafter. Ray, not so: but if it be first learned, then that a man be able (I mean) to learn, perceive, and attain to other Sciences; which with:

out it be could never get.

Scholar, I perceive by your former words, that Altronomy and Geometry bepend much on the help of numbring but that other Sciences, as Musick, Physick, Law, Grammer: and such like, babe any help of Arithmetick, I perceive not.

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Master. I may perceive pour great Cterke linesse by the ordering of your Sciences : but I will let that passe now, because it toucheth not the matter that I intend, and I will shew you bow Arithmetick both pross in all these, somewhat group, according to your small understanding; omitting other reasons more substantiall.

Mufick.

Phyfick.

First (as you rection them) Musick hath not onely great bety of Arichmetick, but is made, and bath his perfectnent of it: for all Musick Canbeth by number and proportion: And in Physick, betwee the calculation of criticall daies, with other things, which I omit, bow can any man judge the pulse righting, that is ignorant of the proportion of numbers?

Law.

And as tor the Law, it is plaine, that the

ther meet to be a Judge, neither an Advocate, not pet a Proctor. For how can hee well unsecretain another mans cause, appertaining to distribution of goods, or other debrs, or of summes of money, if he be tanerant of Arithmeticke This oftentimes causeth right to hee hindred, when the Judge either belighteth not to heare of a matter that hee perceiveth not, or cannot judge for lack of understanding this commeth by ignorance of Arithmetick.

Bow, as to, Grammer, me thinketh you Grammer, thouse not boubt in what it neepeth number, fith you have learned that Nouns of all forts, Pronouns, Verbs, and Participles are diffind diverly by numbers: betives the variety of Nouns of Number, and Adverbs. And if you take away number from Grammer, then is all the quantity of Syllables toft. And many other wayes both number bely Grammer.

Whereby were all kindes of specters found and many that was it not by number?

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But both needfull Arithmetick to to all Philosoparts of Philosophy, they may foon see, that phyboreas either Aristorle, Placo, or any other Philosophers writings. For all their examples almost, and their probations, depend of Arithmetick. It is the saying of Arithmetick, is meet to no Seither. And Placo his spatter wrote a little Tooms

fentence over his Schoolhonfe boot, Let none enter in hither (quoth be) that is ignorant of Geometry. Deeting bee mould babe all bis Scholars erpert in Geometry, much rather be would the fame in Arithmetick, without which

And help needfull Arithmetick to to Divi-

Geometry cannot frand;

Divinity.

nity, it appeareth, feeing fo many Doctors gather fo great mysteries out of number, and fo much be watte of it. And if I Gould go about

to write all the commodities of Arithmetick

in civill ads, as in governance of Commonweales in time of peace, and in due probifion e

order of Armies, in time of war, for numbring of the Hoff, fumming of their wages, provide

on of viduals, viewing of Artillery, with o ther Armour; beside the cumpingest point of

all, for casting of ground, for encamping of men, with fach other like : And bow many inapes also Arithmetick is conducible for all

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private Weales, of Lords and all Molfestion ners, of Merchants, and all other occupiers, and

generally for all estates of men, befices Anditors, Treasurers, Receivers, Stewards, Bailiffes,

and fuch like, whose Diffices without arith metick are nothing : If I thould (I fap) pas

ticularly repeat all fuch commodities of the no ble Science of Arithmetick, it were enough is

make a very great book. Scholar, Po, no, fir, pon thall not needs #10 I doubt not, but this, that you have faid, wen enough

Armice.

enough to perfinate any man to think this Art to be right excellent and good : and so necessary for man, that (as I think now) so much as a num tacketh of it, so much be tacketh of his sense and wit:

Mafter: What, are you to farre changed fince, by hearing these tew commodities in general? by likelyhood you would be farre changed if you knew all the particular Commodities:

Scholar. I beliech you Sir, referve those Commodities that reft yet behind unto their place more convenient; and if yes will be so good as to utter at this time this excellent treasure, so that I may be sometimat inriched thereby, if ever I shall be able, I will requite your pain.

Mafter. I am very glad of your request, and will doe it speedily, fith that to learn it you be foready.

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Scholar, And I to your authority my wit The duty doe laboue, inhatsoever you say, I take it so, of a Schotrne.

Master. That is too much, and meet so, no man to be beleeved in all things, without thewing of reason. Though I might of my scholar some credence require, yet except I have reason. I doe it not desire. But now persevents you are so earnestly set this Art to all rance in thine, best it is to omit no time, less some study.

Other passion cools this great heat, and then you

pour lease off before you fee the end, of the

scholan Aljongd many there we so unconstrant of mind, that sifteer and then with every whose, which betten begin, and nover pure to the end, I am none of this sort, as I tent you partly know. For by my good will what I once begin, till I have it fully ended, I would never blitt.

Maker. So have I found you hither to in deed, and I trust you will increase rather then goe back. For better it were never to allay, then to whink and fig in the mid to approximate I trust you will not doe to; therefore tell me which we will will you the Science that you before to greatly.

Scholar, Will by fir, you know.

Master. That maketh no matter, I wonld beare to better you know, and therefore I ask you, I of great rebuke it were to babe this bied a Secience, and get cannot tell how it is named.

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Scholar Some call it Arfemetrick and fome

Malter And tohat boe thele names beto-

Scholar aroat if it please gou, of gou thouse

Master. Both names are corruptly with ten : Arlemetrick for Anthemetick; us the Orecks call it, and Augume for Algorisms as the Arabians found it which both beto

Apolitin-

the the Science of Numbring : 603 Arabinos in Greek is called Number: and office consider the Art of Numbring, so that Arithmetick; the Art of Numbring, so that Arithmetick is a Science of Art teaching the manner and nie of Numbring: This Art may be inconght diversly, with Pen 83 with Counters. But I will first their you the working with the Pen, and then the other in other?

Scholar. This I will remember. But bots instrictions are to bee learned to attaine this Art fully

Matter. There are reckoned commonly to

Numeration, Addition, Subtraction, Multiplication, Division, Progression, and Extraction of tools to their some men able Duplication, Triplation, and Mediation. But us to the three last they are contained under the other leven. For Duplication, and Triplation are contained under Multiplication, as it mall uppear in their place: And Mediation is contained under Division, as 3 will beclare in his place also.

Scholar, Det then there remain the first fe-

en kinds of Numbring.

Malier. So there both: bombest if I will speake exactly of the parts of Numbring, must make but five of them: so: Progressian is a compound operation of Addition, Mulphration and Division. And so is the Extraction

tendious of roots. But it is no barm to name tinds feverall, feeing they appear to bave forme feveral inorking. For it forcets not formuch to contend for the number of them, as for the due knowledg and practing of abentant of man fle doorm at us a late this

Scholar, Then gon will that I thall name them as feben kinda diftina, But now 3 defire you to instruct me in the use of each of

them. Mafter. So 3 will, but it muft be bone in order: for you may not learn the last to food as the first, but you must learn them in that or der, as I did rehearle them, if you will learn them speedily and well.

Scholar. Chen as you please. Then to be gin: Numeration is the first in order, into

thall 3 ooe with tt? Man and sien

Mafter. First, pon must know what the thing is, and then after learne the use of t e condition someos helicis fame.

ment in their place than M. forcon forom and of stating In Numeration a recommendate



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Vmeration is that Arithm ticall skill, whereby we me duely value, expresse, read any number or fumm propounded : or else in figures and places fet down any number known or med.

Scholangur

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and derence between the value and the fi-

Makera Deale doe 3. For the value is one thing, and that to methy parting by the divertity of figures; but chiefly in the places wherein they de let. Scholar Then much 3 know between these

things the solves the figure and the place of the solves of the per land of the figure and the place of the solves of the solves

1. 2. 3. 4. 5. 6. 7. 8. 9.

fame fort use besentier, that after the same fort use besenter, that which the state of the same of the state of the same of t

desired and resident and resident and resident and experience of the control of t

A place is called the feat or room that A place, of siguro Manoeth in. And look boins many

C 3

figures

figures are implifen in one fumme, fo mishy places and that topole number. Antithat moft. be called the first place, that is next to the right; hand, and to retkoning by order foliards the left hand, in that that place is last that its note to the left chand. As the example of the fixed from before positive men in a voin, fibe by fibe, and you thouse delibere as they film but adder, beginning with the man that were next him your right band; that he that were next him there were him.

The second 3530

report agent as and special section of the state of the office that the feeded and so so the that of the office of the state of the sta the first, g, the second, f, the third, e, the found d, the fift, c, the fixt, b, the seventh, a, the 1.0. 8.4 5.6,7.8.9. eighth.

Mafter. That is well done. And after the same sort use hereafter, that what I declare by one example, due pour expresse by mother: and so shall I perceive whether you understand it cette it well made over mething, thit you per cette it well may be expert therein. I coil diff a Scholiff I pray you how many of their

places be there mall some soule and dies .

Mafter. There is no certain number of their Abat they are fortetimes more, and formetimes famer, according to the funt that he expressed

For to many as the figures are, to many are the placest: and the last place is to called, not becalle it to laft ofalt other, but it is the laft of that prefent fumme, and it may be the middle place in another fummed and similar

Scholar. We feemeth I perceibe this bern well; as fouthing the piver of rechoning of the places: but as for the number of them, pour lapthere is no certainty. Poin there refleth to Declare the value of the figures by the Diverfitp of places, tobich poti called the value un Value uncertaining treates theorem and early direct and

certain.

Mafter. But firft let me hear whether pour know vertealy the certain value.

oscholat. Des fir, as you wrote them, fo 3 2) hours of marked them.

Malter. Bow waite pon then five ?

Scholar Bo this figure 5. 3 state 1

Mafter and how fix to a collect accessor

Scholar, Thus, 6. and the all the bolt and f

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iet:

Malter. Warite thele three numbers, each ha it felt, as I freak them; vititit. iii.

Scholar, 7. 4.13. (1100) 30 11 11 11 11 11 11

Malter Dow write pon thefe four other. tt. t. tr. bitts ward maderad and a tr

Scholar. Thus (3 from) 2, 1. 6. 8.

Malter Bay there you mille : look on mine erample again.

Scholar, Sir, true it is, I was to blame, I take 6-for 9, but I will beware hereafter.

Mafter. Roto then take beed, thole, certaine

tain.

tain values overy figure representeth when it is alone written without other figures joyned to him. And also when it is in the first place, though many other doe follow: an sor example, This figure 9 is ir, standing now alone.

Scholar. How is be alone and flanbeth in the mipple of to many letters?

Maker. The letters are none of his fellows. For if you were in France in the minole of a thousand Frenchmen, if there were no English man with you, you would reckon your self to be alone.

Scholar. So it is. Then 9 without moe figures of Arichmetick betokeneth in whatforeber other letters be about it.

Master. Even so and so both it, if it be in the first place somed with other, how many soever doe sollow, as in this example, 3679. You see 9 in the first place, and doth betoken nine as it were alone.

Scholar. I perceive that, and both not 7 that standeth in the second place, betoken bit, and so 3 in the sourth place betoken three 2 in the source of t

Master. Their figures be as gou have said, but their values are not so. For as in the first place every figure betokeneth his own value certain onely, so in the second place every figure betokeneth his own value certain, ten times: as in the example, 7 in the second place

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is leven times ten, and is ler . And in the third place, every figure betokeneth his own value an hundred times, fo the 6 in that place betokeneth bit C. and in the fourth place every fire gure befokeneth his ofon value a matimes as in the storefato number grinothe fourth place Danbeth for a 20. and in the fifth place every figure frandeth for his olun value ? . times and in the fixt place a C.D. times, and in the feventh place a spotimes, and in the cighth place repep, to that every place exceeded the former centimesures

Scholar As thus : if I make this number A generall stall adventures, 91359684, bere are eight Rule, places In the first place is 4 and betokeneth nt four: in the frond place is 8 and beto-leth ten times 8 that is 80. in the third place and betokeneth fix hundred : in the fourth lace o is nine thousand, and the fifth laction of times 5, that is fifty . So 3. in e fixth place is a Co times 3, that is, CLOD. Then I in the seventh place, one and gith the eighth place, ten thousand houland rimes 9, that is rep . But now 3 mnot easily not quickly read it in other.

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Malter. That thall you practie by this it seans. First, put a prick ober the fourth ue gure, and so over the seventh. And (if pour en the lo many) over the tenth, thirteenth, sixce fween each two pricks. And thole two

roomes

Ternaries.

roomes between the pricks are called Terns

many figures are befineen their and the end, which cannot palls three reckening himselfs to one: then pronounce them as if they seen their balue, to many times choulands as you numbers balue, to many times choulands as you numbers balue, to many times choulands as you numbers balue, to many times choulands as you

After that, dome to the next three figure and folian them as if they were apart from the rest, and above to their value so image time a thousands, as there are pricks between the and the first place of your topole mumber. As to be been other three sigures folialning, you have more that in example, or 3 500684 its may poor number?

Dut a prick over 9 in the fourth place, a over 1 in the feventh place, and then no mo (for your places come not to tear) as the

91359684.

Pow go to the last prick oper, and to it and the figure o that followers it, and but them alone:

Scholar. gr, that is, ret.

Mafter, So tt is, then some for the numb

Schol. That is, pet thousand thousand.

Master. So it is. Then take the three of figures from one to the next prick, and batthem.

Schol

bi

lett

wb

MB

to m

lace

Fin

Scholar 159 that is, C.C. liveled Material pois adde to the one prick, that sadols Car lir thousand and a form by

Maken Then come to the other three figures finemene of tell, the winds and

Schole 84 thit is bid tovitit.

- Walter Reto bake you balden all. And at the and of the late number pour shall abee no. thing, because there remaineth no prick not mund confint it a get probe it to another numher, as thus, 43.48 64089 1053 40.533 90.5313

व्याधारम् अस्तर् हि , जिस्स् स्वार्थित वर्षे अर्थित । जान with a poin thight me, but I aim in boubt without himse word well by my because of the Cophers to I temember you told size that we de lightly nothing, and therefore I coubt whether I thould reckon them for a figure in tetting of the pricks, and again, I know not wherefore they fer we to the second of th

Mater Lint will I fell von mole. Indeed they were rate balde themselves; but they ferve to make up the number of places, and to make he figure tollowing them to be in a further place, and theretore to lightly the more value, win His erample, go the Cypher is of no vai her but pet bee occupieth the first place, and callety to be in the freend place, and fo to of limity ten times 9, that is re. to that two Cyana place to the figure following them into the third place, and to forth. chole Scholar.

Cyphers.

Scholar. Then I perceibe in the evaluple above, I have pricked well enough, for though that Cypher that is pricked fignify mothing, pet must be have the prick, because he came in the thirteenth place. Then wall I probe to mumber that summe. First, there is 23 all P, 19, 19, 19, 19, 10 then followers 864, 19, 19, 19. And what thall I now door where is a Copher in the third place, and no figure after him but they that (I have reckoned) Minable and

already rechoned, to make them indicated further then they thould be, if he were lained and therefore note be that let birt sen An to to always, when he occupyeth that you next before supported, which is the last of the Tarnary, and a Cypher in the last plate out

scholar. Then hall I fay but \$3.90 Mill

Mafter. So, but go forth and act of the said fpent, and pet remain 349 do that 3 must be ine them, Cot. ri, onelg hang of en sham

Mafter, daw can pour reckon after the fort: and remember that every fact soom, parted, is called a Ternary, of Trinity, for pothabe numbers, or baland the fumme most fru ly, and by the aid of the paicks each denomina tion is diffind most plainly. which and glind

Trinity. 119111912

Denomination.

tion?

Scholar ... Denomina diplace, a ... fo foilb.

Mafter

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Mafter. It is the late balge of hame about toang famme. As toben I fapl an bundred tion and twenty pounds : Pounds is the Denomination. And the wife in fair na. 25 ment Men to the Denomination, and to of other: But in this place (that I fpake of before) the last number of every Ternary is the Denominution of it. As to; the first Ternary, the Denomination is unites, and of the fecond Ternary the Denomination is thousands, and of the thies Ternary, thousand thousands Millions of the fourth, thousand thoufand thousands, 02 thousand Millions and fo number to called an'er, thetelicol

Boholar, And what thall 3 call the value of the three faures that map bee monounto before the Denomination, as in faying, 201000000 that is two hundred three millions. I perceive by your words, that Millions to the Denomination : but tohat mail 3 call CCiff. joyned befoze the millione and the ball specific

Mafter. That is called the Numerator of Numeravaluer, and the tobole fumme that refulteth tor. of them both, is called the fumme, value, 02 Summe or aulay it maner best to the below and the below of value.

Scholar. Bow is there any thing elle to be learned in Numeration? or elfe babe 3 learned cross verscomber mains alie tipos

Mafter. 3 might theto pon bere toho were the first Inventors of this Art, and the realou

fter

of all those things that I have taught you, but that I will refer to till be have learned over all the practic of this Art, less I should from the you with over many things at the first

But pet this you must mark, that there are three kinds of Numbers, one called Digits; another Articles, and the third Mixt numbers

A Digit to any number under ten, as the fet

And 10 with all other that may be divided into ten parts just, and nothing remains are salled articles, such as are 10, 20,30,40150,66, 100,200. 66. 1000. 66.

Mixt.

Three

Digits.

Articles.

kinds of numbers.

And that number is called mixt, that contained articles, or at the least one article, and a digit, as 12, 16, 19, 21, 38, 107, 1004, and fo forth: and for the more ease of understanding and remembrance, mark this. The digit number is never insistent with more then one figure, but the article and the mixt number are ever togitten with more then one figure. And thus they differ, that the article bath evermore this cypher o in the first place: and the mixt number bath ever there some digit.

Scholar. By these last words I percein it much better then I did before, and now (I think) I will never misse to know those three atomper.

Master. If you remember now all that I babe said, you have tearned sufficiently this will kind of Authorick talled Numeration

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potobett I will export gon note to remainben inplant to exercise pour lett in the marile of the mattheware parties are but a tight life maknowledge, and plattle if is that maketh men keth maperfed and prompt in all things.of ons offered flery.

And as poir have tenened to anther and erreflette balae of a fumme pibpogabetisano nt point before pour la must podspontife to meter note, and legite voten with ant figures, no in one places, any number onely names, precited to you, or if your felf imagined; as n a proof. How note you, or write down this mme, five thouland two bundled fifty and even ?

Scholar. This troubleth me now, whether should begin at the first, or at the last. For eason (me thinketh) (bould cause me to begin t the first, and pet if I write it as you speake

, 3 must begin at the last.

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w:

Master. Withen you know your places peredly, you may begin where you lift; but the tope eafe for pour band is to begin with the at that is to lap, as 3 did speak them, pet for e more furety, a while you may begin with e firth, repeating my words backward thus: ven, fifty, two hundred, five thousand:02 else unding them all by their digit, oz value, as as a feven, five, two, five; for that way is att: But then must you look well whether on ere be any cypher in your summe, that hee map

Numeration pour fumme (us you specials) be above of then cea cypher in the first place. And if it be and der Himoged, or above, then is there two cy phers, one in the first place, and another in the Tecond, and fo. forth. Ha at the san fact the But because this thing to fach that canno be fet forth without many words, I think be ters noto at the end of Numeration, to abbe Table easie and ready to the first every ofthen gieffe to lame, game es ing end all en italigares follocity in concidentias a growt, usute notice in the contract describing mm, fire frontant (100 1. mayor fife and Lothis is the Table. hould begin at the first or at the toth. For 01 plant are to finishing) (some reader are to begin 545 he first, and police where it as possible the cool soft is might them be 13 Mafter, College pos arour roge places per-10 the you may begin touse routly; but the self files pippl of al Sand along tolk olan an athat for tolling, as I vigilealt form get for 30 filled ribed game i og shifet a gleraf grent be dest reprise and the leading of the party of gro earlife, i.w. diametred the chanding of the configuration of value, and their colors of the configuration of t nis to be any orpher to personal that bot 011 CERT) um

0)	X.M.of Millions.	M of Millions,	X. of Millions	Millions.	C. of thousands,	X. Thom ands.	Thousand:	Hundreds	Tennes.	Vaites.	The comminator of the place value uncertain.	
0	9 8 7 6 9 4 3 2 1 0 Tench	98765 43210 Ninch.	4 3 2 1	5 4 3 2 1 0 OUNT,	8 1 7 2 6 6 7 3 3 3 2 2	9 9 9 8 8 8 7 7 7 66 6 6 5 5 1 4 4 3 2 1 1 0 Fourth.		8 7		5 4 3 2 1 O First d	Nine. Eight Seven Six. Five. Foure Three. Two. One. Ciph. heorer of	

This Table (as you may see) hath eleven places, and in each of them are set all the District whose certain value is written on the fight hand of the Table, and the value uncersain on the lest hand; so that bythis Table on may learne both how to express any umber that you list, if that it exceed not eleven

eleven places) that is to fay, IC. thousand millions, abb to mag you by belp of it, balue all foms propoled anner the late number.

Por example, take the fumme that 3 moi poled before, which was five thousand, two hundred fifty and feven. And it pon will erpreffe it, take the first number (as I speak it) which is five ap. whose valuer of certains value is b, and his uncertain value, o) denomination is sp. firet you wall feek at the right hand of the valuer 5. Then feek along under the title of denomination to ware the left ban till you finde thousands, and under it, sign at the foot of the Table is the number of the place that is in the fourth, wherein you must watte pout digit of valuer 3.

Afterward come to the fecond part of the number, two hundred, tohote valuer is 2, an dis peromination C. Seek two at the right band of the Table, and go along under the de nomination toward the left hand, till po come under C. then look to the foot of the Ti ble, and there you thall fee the number of the place, that is to fay, the third, wherein yo

must fet pour digit 2.

Then doe to by your other two number that remain, and you thall find 5 in the li cond place for your fifty, and 7 in the fir place for your leven. And thus you may b with other numbers.

Scholar. Pattet, I thank pou beartily. perceive you feek to instruct me most plain

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and briefly, and not to the point anothledg with fabille words as many bo. For this rate to lo plaine, that I can befire it no plainer. And though it feel fome what long, get 3 verceive it to be a face way.

Willer So it than though it be long, pet it is neither top tony, neither too plain for points tenentes that the practite : to this rable in Read of a Teacher to them that tath one But from I tente I pave fatto enough of Mil. then may you learn forth.

nie pone judgment. Edby by men reckon the vider of the places backibaed, trom the eight band to the left?

Marter In that foing all men be agree that Why numthe Children worth first inbented this Art, at writen fet these Figures as they set all thest Letters, backward... to be they read. And that that appear in att Hebrew, Chaldee and Arabick Books; for thep be not onely written from the fight band to the left and for that be read, but allo the eight end of the book is the beginning of it, ibbereas the Greeks, Latins, and all Pations of Europe, bo write and read from the left hand toward the right : and all their Books begin at the left fide.

Scholar. That reason bath latisfped me. Mafter. It neither latisfyeth me, neither likethme well, because I see that the Chaldees 丑 2

bers are

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and Hebrews Do not to use their ofen Name bers, as at another time I will declare. But this plain reason may belt satisfy you present. ly, that feeing in pronouncing of Numbers me keep the order of our own reading, from the left band to the right : and again, lue do ever name the greater numbers before the Intaller: It was reason that the letter places, containing the letter numbers, thould be set on the right band, and the greater places containing the greater numbers, to proceed to ward the left hand.

Scholar. This reason is to me to plain that it feemeth noin against reason to make a ponbt of that order. So that now for Numeration I am latistized; boping that practic thall make me fully ready and erpert in it. And in mean feafon 3 defire to learn the other

Kings of Arithmetick.

Mafter. That is well faid : but what thoul

you nert learn? can you tell?
Scholar, I remember you lato that Additi-

on was next.

Mafter, Even to, and lobal that is, must per fire know. o primal and select sold sold

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Addition.

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Ddition is the gathering together and bringing of two numbers, on more into one summe. As if 3 babe 160 Books in the Latine tongue, and 136 in the Greek torigue, and would know bow many thep bee in all. I must write these two numbers one oper another, writing the greatest number bighest, so that the first figure of the one being under the first figure of the a and the fecond under the fecond, and fo for oaber. Telben pon have fo bone, draw under them a right line, then will thep Cand thus: Aow begin at the first places toward 160 the right band alwayes, and put to-136 ther the two first figures of these two numbers, and looke inhat commeth of them write under them, right under the line. 160 As in faping 6 and 0 is 6, write 6 un: 136

And then go to the second figures, and do likewise: as saying 3 and 6 is 9, 160 write 2 under 6 and 3, as here you 136 see.

der 6, as thus:

And like wife do you with the figures that be in the third place, saying, 1 and 1 be 160 2, write 2 under them, and then will 136 your inhole summe appear thus:

So that now you fee that 160, and 136, do make in all 296.

Scholar. Wahat? this is very easie to do.

me thinketh 3 can do it even fince.

There came through Cheapside two broves of cattell: in the first was 848 sheep, and in the second was 186 other beasts.

Those two summes I must write as you taught me thus, then it I put the two sire agures together, 848 saying, 6 and 8, they make 14. 186 Lbat must I write under 6, and 8, 14 thus:

Mafter. and bere you are tipice Deceived. Fit going about to abbe toges ther two fummes of fundip things, which pou ought not to doe, except you feek onely the number of them, and care not for the things: For the fum that thould refult of that about on, Could be a fam neither of fheep, not of other beafts, but a confused fum of both. Down belt fometimes per thall have fams of divers denominations to be added, of which 3 will fell you anon : but first 3 will theto pour where you were deceived in another point. and that was in writing 14, which came of a and 8, under 6, 8, which is unpollible; for bow can two figures of two places be written unber one figure and one place ?

Scholar. Ernth if is , but pet 3 bib fo une

derstand you.

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Maffer I faid indged, that pour fhould write that under them that did result of them both together. which saving is almaise true. if that fumme poe not exceen a digic : but if it beamixt number, then must you write the digie of it under pour figures as you babe faid before, and if it be an acticle, then waite o misder them, and in both forts you thall keen the article in paur minne, and therefore when you have added your focond figures, which occupp the place of tens, you that! put that one therefor lubich you kept in your minde; for though it were ten indeed, pet in that place if is but as one, because that every one of that place to terme, for that it is the place of tens. And in like manner, if you have in the fecond place to great a number that it amountethas bobe o, then write the digit, and referbe the article in your minds, over adding it to the next place following, and fo of all other placos, boto many fosper you have. And if you babe a mist number tuben pou babe abled A place. your last figures, then write the gigit une ber the last figures, and the article in the nert place beyond them: to that pour name. ber refulting of Addition, have one place more then the numbers which you half adde together. arcicle 1 in my primor, thed

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Scholar. Dow doe I perceive pan and the rulen of this to (as I under Cand) become that up one place can contain abobe of inhich to thegreatest figure that to and them all tens doides

or arricles must be put to the nert place follows ing: for every place (as 3 may fee) erceebeth the other place nert before him by 10.

Row, if it please you, I will return to my example of Cattell. But I remember you said, I might not abbe summes of sanday things to

gether, and that I map fee by reafon.

Maker. Evuth it is, if you leek the due fumine, of any thing, but if you onely fock a bare fumine, and have no respect to the thing, then were it better to name the summe onely without any thing a as in saying 848, without naming sheep or any thing else. And likewise 186, naming nothing.

Rowlet me fee bow you can abbe those tive

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fanames.

Scholar. I must first set them so that the time first figures stand one over another, and the other each one over his fellow of the same place: then shall I draw a line under them both. And so likewise of other figures, setting always the greatest number highest, thus as tolloweth.

Then must 3 adde 6 to 8, which make 14, that is a mixt number, therefore must 3 take the digit which is 4,
and write if under 6 and 8, keeping the

article 1 in my minde, thus:

Pert that, I be come to the second figures, aboung them together, saying 8 and 4 make 12, to the which I put the one referbed in my minde, and that maketh 13, of which

mbich nun	ber I watte the digit	TE milyNLY
	b 4 and keep the articl	
to my mint	e, thus:	186
Then co	me 3 to the third figur	res, 34
faging, 1 a	nd 8 make 9, and 1 in	Market Charles Solls
mp minde	naketh 10. Sir, Wall	I write the
Cypher uni	oer 1 and 8 2	DE THE WARREN

Mafter. Den.

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Scholar. Then of 10 3 write the Cypher under 1 and 8, and keep the Article in my minde.

Mafter. What needeth that, feeing there

follow no moze figures ?

Scholar. Sir, I had forgotten, but I will remember better hereafter. Then feeting I am come to the last figures, I must 848 wite the Cypher under them, and 186 the Article in a further place after 1034 the Cypher thus:

Malter. So now you fee, that of 848, and 186 added together, there amounteth 1034.

Scholar. Pow 3 think 3 am perfect in

Master. That will I prove by this example. Thire are two armies of Souldiers: in the one are 106800; and in the other 9400. How many are there in both armies say you?

Scholar. # frit, 3 fet them one ober ano-

ther, beginning with the field num-

But the nether number will not 9400 match the over number.

Mafter

32	AQ	dicton.		8777
Mafter, I			us Intern	dalgiri
Scholar. 2			4 JUS 8	manin,
to o, and the				6800
that must 3				9400
Arst place th	us.	To bin 8	0 313	mias
Mafter. T			fein vond	
Scholar. 9	then likel	vife in th	(econd	place
3 abbe o to	o, and the	re artieth		6890
o, which I t		rthe le	The same	9400
cond place th	mg :	13 July 52	A . 10 2 2 2 2 10	00

Then I come to the third place. faping, 4 and 8 make 12, of which 06890 I write the digit 2 and keep the 9400 article I in my mind thus :

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Then 3 adde 9 to 6, which make 15, to that 3 abbe the article 1 that 106800 was in mp,mind, and it is 16,3 9400 ipatte 6 unber 6 and 9, and keep one in mind thus:

Mafter. With Boe pounot waits both figures feeing you are come to the last couple of man bers ?

Scholar. Rap, reason weweth me, that I must abbe that greiele that is in my mind unto the next figure of the over famme, though there be no more in the nether furning. ladok

Malter. Ehat is well confidered : that de fe.

Scholar. Then fap 3. o in the over famme and I in my minde maketh as that write ? under

under o. Then followeth there yet one more in the over lumme, which bath none to be added to it, for there is none in the nether fam, nor yet in my mind; therefore I think I must write that even as it is.

Mafter. Dea.

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pear thus:

Master. If you mark this 9400
you have learned perfealy 116200
the common Addition of

all summes which are of one denomination: so that yee observe this also, that in Addition you must have two numbers at the least: or else how can you say that you doe adde? And ever let the greatest number be written highest. so; that is the best way, though it be not necessary.

And forget not this, that (if you have many numbers to adde together) you shall have oftentimes an article of a greater value them to, sometimes 20, sometimes 30, sometimes more, yea (peradventure) 100. Therefore as you did with the article 10, so do with them, reserving them in your mind, and adding to the number nert following so many, as their valuer or value certain is: that is to say, 2 so 40, 3 so 30, 5 so 50, 10 so 100, 12 so 120, and so sorth of other like. So that if the article be 130, then must poulet down the pand keep 10 in minde, to be carryed to the nextrop of figures or place. If any such hap-



pen to come. It of your vetter underwands
take this example for all.
I would abbe thele thirteen fummes 148
into one, which I fet after this man- 45
ner: then bo I beginne and ga- 22
ther the fumme of the first row of 36
Figures, which come to 107, (for 22
I take 9 there tenne times, and 40
that is 90) then 9 and 8 is 17, that 10
is in all 107, of indich samme 3
write the 7 under the first row of
Figures, and then for that 100 is
fen tennes, 3 keep tenne in minde,
which ten 3 must adde unto the next 189
row of Figures, which are in the fe-
cond place:
which fecond row of Figures (when they a
added together with that ten that I had
my minde) make in all 125, of which fum
write the bigit 5 under the fecond row, a
then (for that 120 containeth twelve tenno
I keep twelve in minde to be about to the
third place of row of Figures; which being
aboed together, make in all 60, the cypher
I fet doton under the row of Figures in
third place :
And the Figure 63 keep in minde to be
ded to the row of Figures in the fourth plan
which (when they are aboed together) mai
29. The Figure of Digit 9 3 let boton and
the fourth place. And because it is my la
worke, 3 let down the 2 also that 3 habet
and the potent the a duty shire of his

um meluho to the a lie the att aland
my minde to the 9 in the fift place, and 4889
to those summes do amake in all equations
20057
39957017001 of Lubon's 11 as notions 2290
A But (for pour more enfe in 1 3699
monke) luben pon babe an addition in 2299
of to mann fummed to been about
of lo many fummes to bee abord to 4099
getner and were belt mart that
fumme into two or three parts, and 111 3298
morte them (chorell and Co
moske them feberall, and fo put in a 299
apply applications concerned and this construction and
mere the helf thing pon tould no 11 1499
Imper o hor mann (mann follows)
inben over many fummes fall to be will 899
appen sent stranger there the treetien ske
Scholar, This feemeth formeinte

by the reason of so many number

gether, 19812 (Ziffink if I doe oftem probe, even with the lame example, either by morking of it alone, or else by parting it as you laid even now, that I wall be able to do so wortly with sup other fam.

Matter So Chall you. For it is offen prat maketha man quick and ripe in all ngs, but because, as well in great summes n final, there may chance to be four errour, nill teach you boin you thall probe inbether thate bone well or no.

cholar, A but were a great bely and eafer.

alter. Begin fird with the highest nums The proof ind then to all the other opperly, and adde of Addititogether, not babing regard to their on. but as though they were alkunites:

and Bill as pour manufer increateth above of call away 9. When go logth, ever calling a to ap 9 as often as it amounteth thereto : and to no till powbase gone over all the humbers that you intended at a to note; and injustice our remainest after facty addition and faiting amon of o. Write it in forme both place by t end of a line, to the votter remembrance : in thus is the first part of four work probe Then secondly, put boutlet the figures the result of the nobition under the line, Itil c Aing away salo. And then that that tem neth write at the other end of the line; and thate two I iguees of time, then have you too done, but is they be unlike then have you will feb. As for example, in this prefent frank The are Figure of the biber line to ther bi golden 8 and 8 is 16 take away 4 there is noth 7, and above that 740 4 that follower and it maisety it, from looken if you time there resteth 2. Then come to the Hert to inhole fire and fecond miniberstire 9, The fore overpasse their both, and take the 7 to t 2 inhich old remains fir the first four that in both 7; put thereto the 4 following, and the maketha titlenie take piant three territie 2. Pert unte that, go to the third line, in tive first numbers pour may let paile becauses of the art which the other two that remainer, the feeend roto) make 6. When go to fourth rolls, topole two field mulibers let

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ain fake the 6 to the s that comained, and that inakethory this rowny, and there reach ?. Sould with the separt is next maketh 6. And so go through all the other mumbers, and you thall ance that there romaineth ; after pou sens cas away diste often as you can this it: bold placether and the one of the line in a alis, too of but at the offer and of the line,

Then gather all the figures of the Wotall mile, which is mivet the lowest life, and call away 9 as often as you can finbe it! as thing and a make 12; take along 9, there redistinguate spare of pontions the street in last, (fotopon majoomit the 9) their both it make 9. species that you made at the both place this: and sell meder be but topen the one

adiant ben pointe that their two frigues be title, beforety jon inay andre that you bute ne tiell, drivide pon tring prove to mit other. inscholare (Interprete pone) in the probe in ther fifth a lost and willing the design would be

Mafter. To ith a good will. andersotar. Egypten to at I write one of pour for-

Firm in the otgoed time 8 day 6 milke 14, heard the state of 106800 de the the total the thirty of the

keth 10, from that I take , and there refleth ons, the next # ignre is 9, and therefore 3 let him alone, to finde I remaining : which I let at the end of a line thus : the man it or of is and the second terms and their

Then I come to the Wotall fum, and there I finde that all the figures put together make 10, from which I take 9, and there refleth ! alfo, tobich I put at the other end of the line, Anna de la Tolling and De thug :

And because they be like, I know that I have well added . ich me palid Base the En

Mafter. So you know now both how to adde two fammes or more together, and all poin to prove twhether you have done well a no : and note 3 will teach you bow to soo formes of others denominations forethe lobich thing jean never be but when the on Denomination to fuch that it containeth the Addition other certain times. And pet you hall and them to the other, not after this fort (as p old them that were of one demanination) be after fuch a lost as 3 will note their you, the Meter. Colding acon falls is to lap :

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in

of numbers of divers denominations,

> Af you have a fumme of dibute benomin nations, then look that yould overy benome tion by himself; with some mate or figure of his benomination, as they are monthly institute. Then write your other summe lo under that first, that sterp one be fet a per the other of the same penominations As for example, if your denominations be pound

pounds, fhillings, and pence, write pounds under pounds, fhillings under thillings, and pence under pence than not thillings under pence not pence under pounds.

finheth it needeth not to warne me of it; for it were spaint reason to to confound summest but pet if you had not spoken of it, peraddenture I should have been deceived in ith was

Mafter. If you to fay it is plain, I will fresh no more of it, but with an example make the matter to appear evidently.

first, one man ometh me 22 l. 65.8 p.anosther oweth me 3 l. 16 s. 6 d. and another oweth me 4 l. 3 s. A would know what this is all logether. Therefore must 3 di. s. d. first set women my great summe, 122—6—8 and then the other everyone un. 5-16—6 ber his denomination agreeing 14—3—0 to the greatest sam, as here you les with a line under them.

Then must a begin at the smalless numbers (which must alwaies be set next to the right) and adde them together: and if the sum toill make 1 or 2 or 3 of the next denomination) then must a keep it in any minor till a come to that place and unter that first place must a mote the residue (if there remain any of the lame denomination:) but if there remain must, then need a to syste under it nothing. And this is all that you must mark in this Addition: for all other things are like to the manner.

charmer of Addiction before mentioned. Therefore the chiefest point of this Addiction is, to know the valuer of common Coines, and rated summer. As bow many Chillings be in a pound, both name peace in a chilling, of which (and of other like things). I will indicate pour deceases in traching of Reduction a But now I may not oftends your told from the things that, we are about the contract of the children in the children in the children is the contract of the children in the

A persona let us returns to that former erample which I proposed of the Debroest which fummes when I have set (organic) they stood thus with a line under them.

Then to adde them into one funder. A multiped at the right hand to bere the finalless discomination is, and adde them together, first saying, 6 and 8 make 14. Rownsteeting them 14 are pence, which contain one disting and 2 pence: she 2 pence: 3 let botom: iso fold a under the line of pence: a and the 124-6-16 one willing 3 keep in importable if \$16-6 to savey so the next row being them 4-3-6 place of willings.

Then bo I adde the chillings together faying, I in my minds and 3 make 4, and make 10, and 6 make 16, and 1 fit the fecond place which Candelpfor 10, make 26, which is I pound 6 s. The 6 s. I let did to 1. It down under the place of this max 6. It lings, as appeareth in the erant of 5 and 6 ple. And the I pound I keep to at 4 and carry to the pounds it is a few for the few for the

SECTION AND

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Then come I to the pounds, adding them altrogether, laping, I that I keep and 4 make 5, and 5 make 10, and 2 make 12. The liquic or digit 2 I let bown right under that place or row of pounds where I gather them, and the article 1 I keep to carry to the nert place, laying, 1 in minds in f. d. and 2 is 3, which 3 I fet both 2 5 8 directly under the 2. And then 5 16 6 appeareth my whole summe 4 3 0 four.

is And thus must pour de with any furd title lamines what sever, whether they be money weight, or measure, which (if you practice biness summes) you that be well acquainted with the feat of Addition.

Addition, or fact other line of brooke denominations, and for the whether you babe well to the brook of the well to the brook of the best of the brook of the brooks.

that I took of the gross Erdhood E visions

Matter That fuel you do by this medit! Proof of you make a Croffe which that bade Addition as having littles as you have land by Denomia of ivers nations in your Addition! The feature add to denominations and the parameter of the Denominations and the parameter of the feature of the parameter of the feature of the parameter of the feature of the parameter of the parameter of the feature of the parameter of the

See partand neither part may 1301 sno

Chinge, and pence) then enalt you make

three lines, thus . The upriable line map ferbe for pounds, and the highest thwart line to, Willings, and the low- se for penceras for example, the fum which we last inrought.

1i. 6 d. 5 6 6 6 4 3 0 2 2

To, the proof of which, because it constained three Denominations. I must make a cross of three lines as in the example before. Then I recken first at the right hand the peace, 6 and 8 make 14, from which I take 12 to the next Denomination, that is to say, a whiling, and there resteth 2, which I must write at one end of the nether thinart line.

After that I gather the sum of the chillings 16,6, which maketh 25, to whom I put a that I took of the pence, and that maketh 26, from those I take 20, the quantity of the next quarter Benomination, that is to say, a pound, and there resteth 6, which I write at the end of the highest thwart line.

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and 2, which make 11. to them 3 about the one that came of hillings, and they make 12, from whence 3 cast 9, and there restetly 3, that 3 3 joyne to the 2 in the next place and they make 5, which 5 3 fet at the Cross

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allo. And thus is my first part of my work proper.

Ehat done I come to the totall summe unber the line, and examine it, beginning at the pence, where I finde but 2, and cannod take y from him: therefore I set him at the other end of the nether thwart line: then I come to the Willings, where I find onely 6, which (because it is less then nine) I set it at the other end of the line of Willings, that is, the obermost thwart line.

Last of all, of the 32 lf. I take three times 9, which is 27, and there remaineth 5, which I write under the upright line: either else I may reckon them simply without any respect of their valuation or place: saying, 2 and 3 make 5, which because it is less then nine, I set under the upright line as before. Then I consider every number, comparing it to the number that is against it: and because I sind them to be every one like his match, I know that I have well done.

N

Scholar. This Crotte I perceive doth ferve to these 3 Denominations, pounds, shillings, pence: but what if I had les, d. ob. and go.

Master. These lines as I have said, do serve so, three Denominations, such as they be, as here three do serve so, pounds, shillings, and pence: but it you have no pounds in your sum, then may they serve so, shillings, pence, and balse penses: yea, so, e. ob. and q. o, in weight so, C. q.and l.o, in measure so, Elles,

C 3

Quarters,

C KA

STALLING.

Quarters; and Nailes, if you have no greater Denomination. To that you remember that the upright line serbeth so, the greatest Denomination, and the highest thinart line so, the next, and the lowest so, the least.

And so it you have four Denominations, you must make your crosse with so many lines. And if your fumme be of more Denominations make so many

lines in your croffe. And thus will I make an end of Addici-

on fabing that here (for the better under fanding of this Kule) I have fet you down certain eramples both of money, weight, and measures, with their works and proofs.

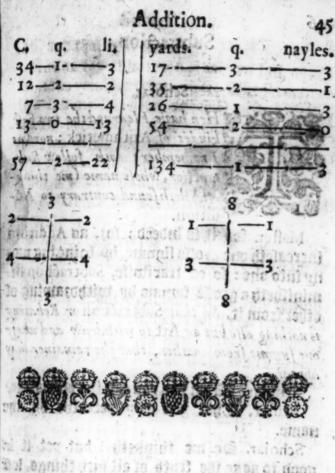
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Fifts

Examples of Addition.



Subtraction

Model. So it is the fuell may. Ludy as fee coule. I would as fee coule. I would not be clare to have graded placingly, that you wall not raid to count. To place to have graded as the formal in the formal not the interpretation of the main is the formal than they form then be you put me in terminal surge, your firm

Scholar.

Hen have I learned the two first kindes of Arithmetick: nom (at I remember) doth follow Subtraction, whose name (me thinketh) doth sound contrary to Addition.

Subtra-

Master. So it is indeed: foz, as Addition increaseth one große summe, by hinging many into one: so contrariwise, Subtraction of minisheth a große summe by withdrawing of other from it. So that Subtraction or Rebating is nothing else but an Art to withdraw and about one summe from another, that the remainer manappear,

Scholar. What doe you call the Remainer Master. That you may perceive by the name.

Scholar. So me thinketh: but yet it is good to aske the truth of all such things, let in trusting to mine own conjecture, I be de ceived.

Master. So it is the surest way. And, as ? see cause, I will still declare things unto put so plainly, that you shall not need to doubt powbett, it I do overpase it sometimes (as the manner of men is to sozget the small knowledge of them to whom they speak then do you put me in remembrance you

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And as for this word that you last asked me take you this befeription : The Remainer to a fomme left after one Subtraction made. Remainer. which Declareth the excelle or Difference of the two other numbers, as if 3 would as hate of fubtract 14 out of 18, there Could remain 4. which is called the Remainer, and is the difference betweeen those two numbers 14 and 18.

Scholar. I perceibe then what Subtraction is now refleth to know the outer bow to mork it.

Mafter. That thall pour Do by this means. First, you must consider, that if you should go about to rebate, pon must have two fundan fummes proposed : The first, which is pour groffe fumme. (oz fumme totall) and it muft be let higheft : and then the rebatement (o) fum to be withozawn) which must be fet under the first, (whether it be in one parcell of in many)and that in fuch fort, that the first figures be one full over another, and fo the fecond. and third, and all other following, as you did MAddition: then thall pon draw under them alme, and fo are your fummes bulp fet to beem your working.

Then begin pou at the right band (as pou in Addition) and withour the nether tumber out of the higher, and if there remain am thing, write that right under them bemail the line : and if there remain nothing

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(by reason that the two Figures were equally then write under them a cypher of nought: And to be you with all the other figures evermore abating the lower out of the higher, sub write under them the Remainder Will till pou come to the end. And so will there appear under the line what remaineth of your grotte famme after you have beducted the other for from it, as in this example. 34 san and his sa

I received of pour Father 48 s.of which habe late out for you 36 s. note would know what both remain. And therefore let my number thus in ozder. First, 3 wall the greatest famme, and under bim the leffer, fo that the fie gures at the right fibe betben one under another, and to the cofu commit

Then bo 3 rebate 6 out of 8, and there refleth 2, which 3 mainers a maite ander them right be- dien . ment to the time thus. I tent does mi and the fire

Then I go to the fecond fie a day once gures, and be rebate 3 out of 4. I write under them right, and if then smit then the whole fumme and operation showing with ration appearet tous in was might med.

whereby it appeareth, that it I withby as out of 48. there remaineth 12, 110 tedans ed mie it regine ichen fignicht in ben be-

risk transmit atoget it das i unit sthola

Scholar. Pom will I probe in a greafer famme, and I will inbiract 3468946 2367924 out of 3468946, those

tums I fet in order thus: Then do I begin at the right fine, and be dut 4 out of 6, and there relief 2, subject 3 mife under them. Then go I to the fecond fiores, a withdraw 2 out 4, and there remateth 2, which I let under them also, then I ke gout of g and there refleth o, which I ifte anser them (for you fay, that if the fit must write the cypher o under them.

Mafter: It was well remembred now go Mallery Everye toell what 3 thail telepto

Scholar, Then I come to the fourth place; no beato 7 out of 8, and there remaineth, which I write under them alto. When toothe ft place, I take 6 out of 6, and there refleth first 3 witte under them the seppher o. then be the first place | grebated from 4 there and in the first place | grebated from 4 there and stills in the feventie and thellast place, 2 ken from 3 there is left a, norma of med) and

ich I matte under them : 3468946 the I done my inhole 2367924 inc., and my funmes pear thus. Calbereby I 1101022 inc. (if I do rebate 2367024 out of

946)there remaineth 1101022.

This is well done. Ind that you lare to percette fully the Art of Subtraction,

traction, let me fee hole pou can sulta 52984732 out of 8250003456.

Scholar. First . 3 fet bown the great fumme, and after that, I write unber it letter namber, begin-825000345 ning at the right live 529847

and then my

Note.

Then take \$2 from 6, and the rest which 3 in: ite under them. Then do 3 draw 3 from 5, and there remains 2, w 3 18:14 under them. Then take 3 feben of 4, but that 3 cannot, what chall 3 now be

Mafter. Marke well what 3 chall fell now, boto you thall do in this cafe, and in other the like: If any figure of the net fum be greater then the figure of the fun that is over him (to that it cannot be taken of the figure ober him hithen must you pu to the over figure, and then confider much it is, and out of that topole furnite in brato the nether figure, and write the vell der them. Can you remember this amon't

Scholar. Des, that I trutt I thall. then in mine example where I thould taken 7 out of 4, and could not, Fout that 4, which maketh 14.from it 3 take a 7, and there refleth 7 allo, which 3 will Der them.

Matter. So babe pon botte well : But in

(W)

inhenfoever you do so put ten to any Figure of the over number) you wull adde one fill to the figure of place that followeth next in the nether line: as in this example there followeth 4, to which you must 8250003456 and 1. And make him 5, 54984732 and then go on as I have

Scholar. Then Chall I say, 4 and 1 (which must put to him so, the 10 that I added to 4 some) make 5, swhich I should take out of 3, 11 that cannot be; therefore I must put to it to 10, and then it will be 13, from which I be 5, and there resteth 8 to be written moer m; and because of that 10 added to the 3, must adde one to 8 that solloweth in the new time, and that maketh 9, which I should be out of 0 and cannot; therefore I put there is 10, 5 that maketh 10, from 10 I take 9, and per remains 1; which I write under them.

Thus do I adde 1 likewise to the next fiure beneath, which is 9, and that maketh 10,
at 10 should I take out of the figure above,
at 10 should I take out of the figure above,
and so take I 10 out of 10, and there resteth
to be written under them.

Then come I to the nert figure, which is and to him I do node 1, which maketh 3, it 3 I cannot take out of nought, there are that nought I make 10, and thence take 3, so there remaineth 7 to be write under them: likewise doe I put Laty for

Subtraction.

ther s, and make it ex, from which 3 revale them. Pow have I 82500034 fpent all the netther 429847 Florices, and what 81970187

shell I be more? Mafter. You Gould have abbed one to nert figure following (if there had been an because you added 10 to the last figure bet of the over line s but being there is no fig following, you must abbe that one to the p following, and then debut that one from 1603.91

number above.

Scholat. When thall 3 fav, becaufe 3 rowed to to the over 5, 3 must put i to nert place beneath, that is under 2, then! I substract that i from 2, and there restel to be wiften under that in the minth pl Pow 3 babe no more to fubittad, for th is not any figure remaining beneath, mel pet any unite to be abbed, because 3 boir ed not to to the figure last before vand pel there 8 remaining in the over line, which think (by realon) thould be fet at the en the figures in the lowest row, which is m the line, to, because there was nothing to from it.

Mafter. That is well confidered, and

fon teacheth fo indeed.

Scholar. But Sit. 3 beleech pou, tha alwayes when any number to remainet ions, as thus 8 bid, write him under the

ffraig

graight against his own place

Mafter. Dea, what elle , whether thep be one or many: and this well remembred, you ave fufficiently learned Substraction: Hoto. eit, because of certain things that might encive you, if you bid not take good beed to our working, I will propose to you another tample of many numbers to be substracted,

thus: I received of a friend of mine to eep 2869 Crowns, of which at one time I ibered him again 500, at another fime 8, at another time 440, at another time 80, another time 64, noto two to 3 know both ny do rest behind. Therefore first I fet mmp groffe fun, 2869 Crowns received. underneath if 3 let

separcels thus, and 500 them a bomble 368

440

en fielt I begin 80 first place, and

8

be

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ther together the nue of all those tines (save the overmost) note neat Figures; and so I voe with all igures of the fecond place, and to touth as pio in Addition, fave that I leave out the Note. their plu of numbers (as the time tourneth indicate funding to gathered between the see the for the funde delibered in all:

h dimme I bo afterwards libitrag out be bigbelt roto of nambers, and the re-Dendo I fet under the nethermost line:

as for erample.

I let the fummes as 2869 Crowns received before: then to I ale 500 ther the first Annes 368 of all the places believe 440 Delivered, the together: where I 80 finde but 4 and 8, that 64

Typhers increase no 1452 Delivered in al Comme in Addition, as 1417 Rest behinde.

you learned before:) of the 12 theref Do I watte the digit 2 between the bon line and keep the article in mpminde, till come to the lecond place, where I finde 6, 4, 6, that maketh 24, to them 3 put the cle in my mind, and it is 25, of which write 5 under the fecond place, and keep digit 2 in my mind to; the third place, w 3 finde 4, 3, 5, that makes 12, to the w I adde the 2 in my mind, and it maketh thereof I write the 4 under the third pl and because there remains no more figures be abbed, I write the digic in the fourth pl as you fee in the example, and fo it appear I have delivered in all a thousand four bed fifty two Crowns,

Then come I to the subtracting of somme between the lines, to; by Addit it is equal to the five parcels over it. The fore I proceed to subtract it from the or most summe, laying, 2 from 9 remains the written under them beneath the low

line. Then in the fecond place I take 5 from 6 and there reffeth 1, to be witten under them. Then in the third place, 4 from 8 reft. eth 4. Laft of all, in the fourth place, 1 from remaineth . Ind thus 3 fee that after thole the lummes are lubtracted from 2869, the Remainer is 1417.

Scholar. This 3 perceibe: but is there no

theater way and more freedy?

Mafter Dea, when pou are a while exerct. Anabridge ed in it : for pou map (as falt as you can gas ment of ther the numbers together) withdraw them manner of out of the bigbest summe: But if in quantity Subtractio. hole numbers added together, erceed the highof famme of upper number, then Wall you as before bath been taught pou, imagine to boz= relu 10, 20,02 30 moe, as need thall require, no pat them to the upper number, to belo to father the abatement, referbing or refloring the articles that you forromed to the next place igain: and fo ffill go forward till von babe inded your work : as for example. In the last mme proposed: I nather first, in the first place 4 and 8 that maketh 12, which 12 3 bond deduct or take out of 9 in the apper number above the line, but I cannot: that berefore I adde unto 9 an article of 10, and taketh the upper number 19, from whence I te 12, then there reffeth 7. then for the are 10 3 adde to the nert place of money bemed, faging, 1 that I bring, and 6 make 7, nos make 15, and 4 make 19, and 6 make 25 which

Qis.

DOE:

inhich 25 I should take out of 6 in the upper number, but I cannot. Therefore I abbe 2 tens or 20 unto 6 in the upper number, and that maketh 26, then 25 out of 26, resteth 1, the tens which I borrowed, 03 have in minde I abbe to the next row, 03 summe believed; saping, 2 that I bring, and 4 make 6 and 3 make 9, and 5 make 14, then 14 out 8 I cannot take, but 14 out of 18 resteth. Bow because there are no more places to abbed, the one that I borrowed, 03 base unince, I repate from two in the upper line, there remainesh 1, which I set bown in the mainer line; and so my summe appeareth, before) to be 1417 Crowns.

Lo thus have you now a thorter way.

Scholar. I like both wates well, and I crive both well: yet, as in the working it meth somewhat long, so in the other it beth very much (me seemeth) to remembran and therefore may cause errour quickly, examine have a quick and an exercised remembrance. But yet so, the tharpening of my his your patience (if you will give me lead in will try what I can be in a like summe, work if the thorses way: whereupon I work to the thorses way: whereupon I work to the state out of 40301964, these three parcel

others of the con-

Therefore I let 40301964 Charge. them first in due 03. 20003428 ber; then I gather 10002432 Disch. the parcels of the 10101461 Disch. are 8.2.1. that is a

Then come I to the second place, saying, 1 that I borrowed to have in my mind, and 6 mike 7, and 3 make 10, and 2 make 12, swhich I cannot take from 6, therefore I adde 10 to 6, which maketh 16, and then 12 from 16, select 4 which I write under the second place between the two lines.

Then come I to the third place, faying, that I borrowed, or have in mind, and 4 make 13, which I bould take out of 9 that is over them, but I must: therefore I adde 10 to 9, which make 13, then 13 out of 19, reft 6.

Then come I to the fourth place, faying, it imp minde, and 1 is 2, and 2 is 4, and 3 make indich, because it cannot be taken from 1; I in it from 11, and there restetly 4.

After that, I come to the fifth place, inhere samely three cyphers, inhich make nothing,

po be all

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unto which 3 adde I in mp minde, then food I take that (that is to lay) I from the figu over them, which is also a cypher, therefore lay thus, I cannot take i from o, but iffr 10 remaineth 9 t fo must 3 write 9 unit them. Then in the firt place I finde but ra I in minde make 2, which I take out of 3 of bim, and the remainer is 1 : that mutt witten between the two lines in the place. So I go to the feventh place, tober finde onely cyphers, and in the grotte fum o them a cypher alfo : therefore muft 3 to the remainer (which is nothing) with a pher alfo. Then in the eight and laft place gather 1, 1, 2, that maketh 4, which if 3 t out of that 4 that is over them, there will thing remain : and that muft be noted t a cypher between the two lines, as 34 often fait, and fo have 3 enved my work, the figures stand as followeth.

But bir, I remember you taught met cyphers thould not come in the last place, because they serve onely to increase the be of other figures which follow them and is not those figures that go before them and in my example I have set two cyphers in

tipo latt plates Janoi set of E on

Master. I commend you to your remideance. And truth it is, you thould not be fet them here; but onely because that I too make you plainly to perceive the Art of a traction. Therefore seeing that you do never

perceibe it, inbenfosber pon would wifte bown a cypher, look whether any other figures be pet behinde; and it not, then let go the o lo, for it needeth not to write him in the later places, inhere noother figure doth follow, ment it be (as Joto now laffer pon) to teneb ne ufe of Sabera dion the plainer.

Therefore pour fim the worke is en-

40301964 Charge.

am plant gid neg 11 .200094287 11 18 11 18 Scholar. Sir, 3 00 10002432 Difch. mie with that that 101014615 moght me before, be thefe two fums

gou faught mee

194643 Reft.

allo, that noto I could fabiract and grame, there is nothing in their erain

alter. So may you to you have marked at I have tanget you. But, because this (as all other) must be learned furely by Spinaile, I will propound here two exmples to you; wherein if powoften exercise the felfe you thall beright and perfect to fub-Ranpother famme lightly, for in them is miained all the observances of whole numand because pon thall perceibe fomehat both how to book to allo tobether ffwell done when you have prober to bo it: mainers. witten under them both, the ermyle os tipo.

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Scholar, Sir, I thank you : but I think might the better doit, if you did theto me the morking of the coop at 8, 113 and of

Mafter, Dea, but pon muft prope pour to do some things without my aid, or alle m thall not be able to be any more then you taught: And that were rather to learne wante (as they call it) then by realon, a againe, there is nothing in these eramples any other of whole numbers, but 3 t

Scholar. When I truth by martie, to atta of Subtraction di vicifacitat : mor of solo

Malter Men, fabing that (as you babe for the In Addition) there are numbers of Diversion Denominations in which the working is now. much unlike a get (without fome infrance bee given of it) it might feem to a learn more difficult then indeed it is Therefore will briefly them you the use of it onely the erample of two. A certa

A centain man owed to me 14 1, 12 f. 8 d. of which he paid me at one sime 41, 6 f, 8 d. at another time 3 hat another 2 1, 3 f, 4 d. and last of all 6 f. 8 d.

Mode 306 mg' Row would I know what re-14maineth unpaid pet, therefore I feting fummes thus, every one 4----6in their bue place: As pounds 3---under pounds, Millings under 2-3fullings, pence under pence. -

Scholar, Sir, I pray you why bo you write al to the common speech used rather to say, 10 Be

Mafter. Wie muft bere ufe the Denomina. Note how tion that is greatest in any samme, so that differeth was map not write according as wee use to from the peake, laying, 16 d, 18 d, or likewife 7 common roats, 8 groats, 24 8, 40 s, 48 s, and order of omination that is in any summe by it mones it, which because it contained.

Mamely, shillings and pounds. So must Morite for the last formme poin named, 1 s. Dit 8, 6 D; 2 D, 4 D; 2 8, 8 D ; 1 6,4 S; 1, 8 s. and fo forth of other like,

Scholar, So that we may not write in Athmerick, pence, when the tumme amounts eth pounds. Aow, if it please you, end regample.

Mafter.

Mafter. Wilhen mp fummes are fo fet as 3 thewed, then (according to the rules of Addition) 3 gather all the particula fummes which hee pape mee into one to tall summe, directly to bee set under them betweene the two lines, not medling will the 14 l. 12 s, 8 b, as the line warne mee : therefoze mint 3 beginne with the Imalleft denomination, lapting, 8,4 8, to 20 pence, which makethone shilling and 8 pence the 8 d. I fet downe li, dill under the place of 14___12____8 pence, and the one Milling 3 keep in 4-82 minde to carry to the 3-0-0 nert Denomination 2 3 4 of Willings. Then come I to the fhile lings, and fay, one og 16:00 8 that 3 bring or babe - thorn 2 11 in minde, and 6 is 4-16-0R 7, and 3 is 10 and 6 makes 16, which, because it containeth m one pound, I fet directly under the place thillings. Then come I to the pounds tobo parcels are 2,3,4, that is in all 9, that 9 do fet downe directly under the pounds : And artic the totall or whole Addition of all the part

culars paid, amounteth to 91, 165, 8 D. Row for the worke of Subtraction, 3 mile al rebate that Totall fumme of Addicion and of the highest number, that is to fay, from

He

long.

Sch

(be 14 b, 12 8, 8 0.

Therefore to performe the work. I fap, 8 b, 11 out of 8 d, remainsth or reflect nothing, there tore in the place of the rest of remains, eight most the denomination, I set bottom of Them comming to the shishings, where I since the which should be taken out of the but I cannot therefore I imagine to borrow 1 of the next denomination, that is, of the 141, and put that one pound so borrowed unto 12 s, that maketh

pow 168, out of 328, resteth 168, which 188, I set downe directly under the place of the Rest.

Laftly, comming to the pounds, laying, one pound in minde that I borrowed, and of make 10, then 10 out of 14, there refleth 4, 1 sno

So doth my whole rest or remaine, appear

This I account the entire twap for a poung leginner to practile, though it bee something long.

Scholar. Is there any thorter way for this worke also?

Malter. Des, as in this late example, I will also thew you, for you may adde together the articular fundmes as

Libreret before the noons Makentanian and

nd la satificial Coount amond o

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gedtorrachen, zer fogen der fiet krauen

they are let in order, begins di. f. de ning with the pence, lay 14 12 8 ing 8, 4, 8, make 20 d, indicate out of the 8 d, above -9 fte. line, but you cannot, 2 3 fterefore thall gon borrow 0 -6 10 fthe next denomination, that is to lay, 1 of the 3 16 fhillings, and put it to the 8 d, that maket 20 d, now 20, out of 20 refleth 0, which cypher I set down directly under them.

Then one skilling that I borrowed or be

in minde, and 6 make 7, and 3 make 19, and make 16, the 16 out of 12 I cannot take the fore of the next denomination. I do borro one I, and put it to 12 s, which maketh 32

there is out of 32 stretteth 16 s. and od

Lastly, I came to the pounds, saying, in minde so that I borrowed, and 2 make and 3 is 6, and 4 is 10, then 10 out of 14, the resteth 4.

So both my remainer, 02 reft appear as i

toze, to be 41, 16 s, o d.

Scholar. Then doe I perceive very include and if there bee no other thing to be learn in Subtraction, then may I come to Multiplication, for that you recknned to bee nert to doer.

Master. We have done indeed with the Ar of Subtraction, as touching the working.

But pet before me goe to Multiplication, 145

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will instruct pour bow to graming pour worke, Proof of inhether it be well done or not. For the performence inbereof if you marke libet I faid in Addition, you may easily perceive what is to be none for the proof of Subtraction, twich tsheft made by the aid of Addition, thus:

Dain under the lowest number (which is Remainer) a line and then adde this rener and all the other that you did fubtrace to together, and together that amounteth the lewer line : and if the fumme that neto thereof, her equall to the highest of Subtraction, then is the Subtraction inell thiozelfo not : As you may fee for erin the lums fet down before, and first in of one denomination, whereof one was

ristor. Good Phus: 8250003456 52984732 4732 fubtracted. m 8250003456, and the

8197018724

mainer to 8197918724 Rom to probe inhether it he truly bezonght Example suot, 3 sobe the remainer and the number in a film of btracted together, beginning at the right one denond; and fire I fap, 4 and 2 is 6, tubich is under the line.

The number given. 8250003456 The number to Subtract 52984733 The Remainer. 8197018724 An The Proofe. 8250003456 jal Then again in the fecond place, 3 fay, 2 and is, which I write under, next that in the mu third

n,

the Digit 4, and heep the arricle 1 th me minde. Then in the fourth place 8 and 4 is a and I in my minde maketh 13, lobereof watte bown the digir 3, and heep the article 1 in my minde. Again, in the fifth place, i an 8 is 9, and 1 in my minde is 10. Whereof fet bolon o and keep the i in my mind And to going on to the rell (as it is laught Addition) when 3 have made an end, 3 f eft be allke i wherefale Pknow that Than Subtraction, then fethe and well done.

So likewife the proofe is to be made numbers of divers denominations las example, in our fumme of that kind wiftel the first forme of working, flood thus: the particular numbers to be fabtraced bein 84733 10 drawne into one.) sherida

Example in a fom of divers denominations.

Where in the title off. of pence, 3 finde 8 and 194 018 12 190111 o: the 8 I fet volume distal anace of ming directly under in that way - 11 1008 F 100 ab of perice. It is animated andienos before ob,

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Then in the place | 20 1 11 11 11 11 billi St Hodge of shillings 3 find 16 be to and 16 which make 32 Shillings, wherein Paid in all, 9 16bat . is contained i l. and 4-16-12 8. the 12 8,3 fet Reft. Down Directly under them in the one place Proof. 14-12of fhillings, and one pound 3 kcep alm il and

Then comming to the pounds 3 fap, 1 that Brkeever and is is, and is is, which 14 in bue order 3 fet down directly under hem as this figure the weth directly. And the shole fumme to 141. 12 5, 80, agreeing fit the upper number above. So 3 finde he work is good, and the Subtraction well seems a made 7, and 3 to to, and 4 tomoral

The same thing is to be done for the latter form of Subraction (where the particular formes are not gathered together into one ande) for the Remainer and all the partimlar fummes fubtracted, being added togeder, if the summe that cometh thereof be the Subtraction well wought, or elfe

Merchanden filed one Jegrodt one us of his he last summes which stood 14-13-8 Example of a proof hus. firft, in the title of pence, -8 in the latof Subtraabde 8, 4, 8, that maketh one -3--- 4 ation. hilling and 8 pence. The 8 3 let down under

one in minde, of that I keepe, and 16 mile 17, and 6 make 23, and 3 make 26, and make 32 shallings, which amounted to a pound 12 s. the 12 s. I set down under the of shillings, and 1 pound I keep of the mind to early to the next Denomination place of pounds. Then come A to be pounds, saying, 1 that I bring and 4 miles, and 2 make 7, and 3 is 10, and 4 make 1 then do I write 14 under the pounds, and have I ended the Addition: and I see that lowest line is like unto the uppermost time number, wherefore I know that I have to bone.

And thus have I taught you the Art of Si traction, and the means to prove whether the well wrought or not. Therefore now will make an end thereof, and will instruct you Multiplication.

Multip

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Kiriptication is an operation wher- Multipliby two fums produce the third : cation which third sam so many times what it is. Shall contain the first, as there are Vnites in the second. And it serveth in stead of many Additions:

As for example : Witten 3 would know boto many are 30 times 48, if 3 should and 48 thirto times, it would be a long work : Therefore mas this work of Multiplication deviced, which thall bo that at once, that Addition honly boat many times.

Scholar. A perceibe the commodity of it partly, but 3 thall not fee the full profit of it, ill I know the whole wie of tt. There: fore bir, I befeech you, teach me the work. ing of it.

Mafter So 3 fooge it bett, but becante Multiplithat great frommes cannot be multipleed, but cation of by the multiplication of digits, therefore 3 Digits. think it best to shew you the way of mattiplying them. And when I fap, 9 times 8, 0218 imes 9, tc. And as for the small digits under if were but folly to teach any rule, feeting bey are foreaffe, that every child can bo it: of the multiplication of the greater digits, ing that you do.

first, fet pour digits one right over the other

other, then from the appermost downwards and from the nethermost upwards, baah traight lines to that they make a croffe, com monly called Saint Andrews croffe, as you fe the dere. Then took bow many each of the lacketh of 10, and write that against each them at the end of the lines, and that is called the diffe-

The dif- rence : as it 3 would know Digit differen ference. - boto many are 7 times 8, B mut witte those Digits 8 this . That held

Then toe I looke how much 8 both differ from 10, 7 and I finde it to be 2, that 2 Digir differe Doe I write at the right 8 12 dill hand of 8, at the end of the Tine, thus, find the series

After that I take a diffe- 7 rence of 7 likewife from Digit differe 10, that is 3, and 3 write that at the right fide of 7, as you fee in this example,

Then doe I draw a line 7 under them, as in Addition, athus: onell o

Latt of all, 3 multiple the two different faging, 2 times 3 make 6, that must 3 c fet under the differences, beneath the lin then must I take one of the differences, wh I will, for all is like, from the other digit (from his owne) as the lines of the Cro

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per of off

inarneme, and that that is

left, must I write under the Digit difference,
digits: As in this example, 10.8 2 3 10.1

it I take 2 from 7, 0) 3

from 8, there remaines 5 5

that 5 must I write under 7 3 alis
the digits, and then there aps 5 6

peareth the multiplication
of 7 times 8 to be 56. And so likewise of any
other digits, if they be above 5, for if they bee
under 5, then will their difference bee greater
then themselves, so that they cannot be taken

other digits, if they be above 5, for if they bee under 5, then will their difference bee greater then themselves, so that they cannot bee taken out of them. And againe, such little summes every childe can multiply; as to say, 2 thresh, 074 times 5: and such likes and 6 11977

Scholar. Truth it is. And leeing mee for meth that I under than the multiplying of the make digits, I will prove by an example of can do it. I would know both many regitmes 6.

Mafter. It is all one in balue to fay o times, or 6 times or but yet the order is belt to put to lefte fumme first, faying, 6 times 9, and for all other fummes.

Scholar. Then would go on the dillion was of the many are 6 constitution many are 6 constitution many therefore g fet the constitution and make the constitution and make the constitution and are constitution and constitution are constitution.

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T beri

Then do I let their différences from 16 at the right lice, the differences 9 rence of 9, which is 1, avgainst it, and the difference of 6 which is 4, against it

And under them draw a line; Then do? multiply the differences together: saying, 1 time 4
maketh 4, that 4 doe 3

totte under them thus:

Then take I one of the
differences from the other
digic, as I from 6, or else
4 from 9, and each wayes
there resteth; which I do
write under the digic, thus,
And so appeareth the multiplication of 6 times 9 to
be 54. Thus I see the feat
of this manner of multiplication of digits?

Master. Rowmight you go straight to multiplication of great numbers, save hoth for your ease and furety in working will draw you here a Table, whereby shall peare the multiplication of all the digits, this is it that followeth.

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	and the	1000	204 (201-1)	Serve Tax	90-279	4.7.43	1. 10	2310
1 1	12:	3	4	5	6	7	8	9
-11.0 12	1040	6	8	10	12	14	16	18
STANCE COL	30	9	12	15	1.8	2 1	24	27
o po se	63,	4	16	20	24	28	32	36
on 2 non	andre	UCC	5	25	30	35	40	45
sasanini Sasanini	nicoin afectua	1160	TQD	6	36	42	48	54
नामु विकास	right	273.1	ohla	W and	7	49	56	63
	ado at	nber	na f	(2317)	18	8		
	10 00 n	200	Very J	Rer	be le	0121	9	81
Residence of the Control	6.7511	1000	. 1 2	1.12	12	1 100		

Is which Table when you would know the proall in any multiplication of Digits, feeke your. of or last Digit in the greater figures, and from goright forth towards the right hand, till you m under the number of your second Digit, hich is in the highest row, and then the number. win the meeting of the rows of little squares birbcome directly from bath your propounded light) is the Multiplication that amounteth of . As if I would know by this Wable the ultiplication of 7 times 9, feek first 7 in the cater figures, and then go right forth toward right hand, till pou come underto of the te roip, in which place where you to come the other digit (as here for example, pour me under 9) is alwayes contained the offcome

come, or product which you feek, and that place we terme to bee in the common angle, in respect of the two numbers so taken on the outlines; as here in that common angle, when the rows of little squares, directly proceeding from 7 and 9 do meet, you have 63, which 6; is the summe of the mulciplication of 9 by 7.

To multiply greater fummes. Scholar. This is very good and ready. An lo may I find the mulciplication of any digit but now how that I do in greater summes.

Malect, When you would multiply any sum by another, you shall marke that it is the meet order to set the greatest number highest, which the place of the number that must be multiplied and likewise the lesser number under it, for the is the place of the Multiplier, or Multiplical that is to say, the number by which the Multiplical cation is made, and is in English alwayes put fore this word, Times: in such speaking who say, 20 times 70. And the number that follow the this word Times, is that which must be a tiplied.

Multiplier.

Times.

Therefore when I would multiply number by another. I must write the givest highest, and the lesser under it, as in Adrian. And under them must I would multiply 264 by 29, I would must be must be them thus.

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be multiplied, may be formed a question thus. There are 29 men, and each man h

264 Limbes. The question is, how many Limbes they have in all.

To the performance whereof, I must multiply every figure of the higher row, by every figure of the nether row and that that amountteth I must fet under the line, as thus:

First, I doe multiply 4 by 9, laying, 9 times 4 (0) 4 times 9, 264 which is all one and that maketh 29, 6, as the Table before of digits of beclare; of that 36 I must but the 6, that is the digit under the 9, and the article 3 I keep in minus to

Then come 3 to the second figure of the

times 6 make 54, and with 264 te 3 in my minde make 57, the 29

If the down under the 2, and 3 keep in minde.

After that I come to the next figure, which is, and multiply it by 9, and that maketh 18, which 5 that I have in minde ma. 264 th 23: wherefore because it is the 29 at worke of the Multiplier, I set

fon in order as you fee. 2376
And to I have ended the first figure of the skiplier. Wherefore I give it now a fine

with my Pen.

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Then begin I with the next figure, and multiply it into all the higher figures, as thus

First, 2 times 4 make 8, that 8 do 237
I witte under the ferond place: for everyofthe digit or first figure of the multiplication that amounte those the figure of the higher number, must be fet under the multiplier of it, to other in their order toward the left, hand.

Scholar. I understand you thus, that digit of the summe amounting of the muplication of the sirst sigure of the higher to by the sirst sigure of the lower row, or muplier, must be set under the sirst place, and that amounteth of the same sirst sigure by second multiplier, must be set under the cond place, and so of the other, if there be multipliers.

Master. So meane I indeed: and if the amount but a digit, then must it be fet un

the multiplier.

And now to go forth: I multiply by same 2, the second figure of the higher a which is 6, saying, 2 times 6, make 12, whereof I write the digit 2 under the third place, 4 the article 13 keep in mind.

Then do I multiply the last figure of the higher fumme by that same 2, saying, two times two is 4, with the 1 that I have in minde maked which 5 I write under the fourth place. I

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to have I ended the tobole Malcig	olication :
wherefore I also give the 2 a bath	T. Banne
with my Wen thus : and fo 3 bo	264
eberas foon as I have dispatched	28
any digit by which I multiply :	Head Mis
and the fummes frand thus.	2376
Then muck I diaw a line un-	528
per all those fammes that mount	1 102
of the multiplication , and must	264
abbe all them into one fumme, as	29
in the example you map fee.	1 -1
There in the first place I finde	2376
but 6, and therefore write 3 if un-	528
ber the line. Then in the fecond	o risti do
place, 8 and 7 make 115, whereof	7656
3 witte 5, and keep one in mp mind	
forth as pou learned in Addition. An	
peareth the whole summe to bee 7650	
amounteth of the multiplication of 26	
am that is the full number of the Lan	
20 men han	A STATE OF

Scholar. If there be no moze to be obser-

example 3 thati prove.

There is a piece of ground which containeth 1365 yards in length, and 236 yards in breadth: I would know how ma-

y yards square there is in all this	1365
piece of ground: Which numbers	1236
let down with the greater as	1345

be, and the letter under, as you

Then bo I multiply 5 by 6, lagit	ng, 6 times
5 make 30, of which 3	31
watte the Cypher in the	1365
first place, and the Article	236
3 3 Doe keepe in minde to	1
carry to the nert place.	91.60
Then doe 3 by the same 6 mul	tiply the fe-
cond figure of the higher fumme, t	which is 6,
faping, 6 times 6 make 36, and	
3 in my mine make 39, of which	1365
I write the 9 under the fecond	236
place, and the article 3 3 keepe	
in mind.	dis go
Then doe I multiply the third	1 1 561
figure, which is 3, by the same 6,	136
and that maketh 18, and 3 in my	236
mind make 21:the 1 3 let bown	1916
and keep 2 in mind.	190
Then come 3 to the last figure o	f the higher
fumme, and multiply it by 6, fagi	ng 6 time
1 make 6, and 2 in my mind make	8, that 8 m
I write under the fourth place:	50 PM
And so have I ended the first	236
multiplier, and dall bim flightly	236
with my Pen.	-
Atten begin I with the fecond	819
multiplier, and fay, first, 3 times	
5 that maketh 15,00 which 3 fet	ava
the 5 under the fecond place, be-	1
cause that the multiplier is	PRO 19.20
there, and the article 1 3 keepe	
in minde.	
	" CT LA

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figure in the contract of the

Multiplication.	79
Then come 3 to the fecond fie	19
gure that is 6, and multiply it by	1365
3, which maketh 18, & with one	. 236
in mind maketh 19, the 9 3 fet	
down under the third place, and 1	8190
3 keepe in mind.	95.
Then come 3 to the third fi-	
gure, which is 3, and multiply it	1365
by 3, faying, 3 times 3 make 9,	236
and with one in mind make 10,	-
the cypher I fet under the fourth	8190
place, and the article 1 3 keep in	095
minb.	1
And then comming to the last	1365
figure a, I multiply it by 3, and	238
it maketh 3, and with the one in	-
mind it maketh 4, which 4 I set in the fift place, and then I have	8190
ended two of the mulcipliers, and	4095
be summes stand as you may see in	the latter
end of the page going before, and th	on A albo
bis dath.	on a gros
Then come 3 to	the thirn
1365 mulciplier, and multi	
236 every figure of the b	igher fam,
and first 3 fap, 2 time	s 5 make
8190 10, of which I fet ti	e cypher
4095 under the multiplie	r in the
o third place and the a	rticle 1 3
ep in mind.	abloid:
and so multiplying the second fi	gure 6 by that
1 2 66	- 14

that same 2, there amounteth	12.
and I in mg minde maketh	13,
whereof I watte the digit 3	un:
der the fourth place, and the	ar-
ticle 1 3 keep in minde:	11.
Then do I multiply the la	id z
Ludha Shire Grane at the bla	L

by the third figure of the higher fumme, which is 3, and that make the 6, and the one in mind make 7, which 7 I fet down under the fift place, as appeareth by the example.

th by the er 4095

1365

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236

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Then come I to the last 1365 place, and multiply that 1 by 2 236 and there amounteth 2, which 8190 I set in the sixth place, and 4095 then doth the summe stand 2730 thus.

and to have 3 ended the

inhole multiplication.

But now (as you taught me)
to know what this whole sum
is, I must adde all those parcels
together, and then under the line
will appear, as you may see, the
grosse of totall sum is, 322140.
Thereby I know there is so
many pards square in that piece of ground.

Mafter. This is well bone.

Scholar. Then me thinketh I could call well done, when I know, whether I had we done or no.

Mafter

Masten. It is to be proved by 9, as Addition was, but the surest proof is by Division, and therefore I will reserve that proof by Division, till you have learned the Arc of division. And anon I will shew you how it is

commonly probed.

But first, for your surther instruction in this exercise of Multiplication, I will with one example more try your cunning, and so make an end: And the question is this. I would know how many daies it is since the Nativity of our Lord, and Saviour Iesus Christ, unto this year 1645. Which to performe, you must multiply this present year 1645, by the daies in the whole year, which are 365.

Scholar. Row for that you have given me to much light into the question, you chall see I

will handsomely finish the work,

1645

for according to your former in-

365

aline under them thus.

Then fay 1, 5 times 5 is 25, 3 fet doing the digit 5, and keep the article 2 in my mind to be added to the nert place; then 3 fay, 5 times 4 is 20, and 2 in mind is 22, 3 imite the digit 2 in the second place, and keep the article 2, to be added to the third place: then 3 say, 5 times 6 is 30, and 2 in mind, is 32, 3 witte the digit 2 in the third place and keep the article 3: then coming to the last figure, 1 say, 5 times 1 is 5, and 3 in mind is 8, with 3 set down in the fourth place: thus

I have ended my first multiplier, which I

Then 3 come to my fecond mulciplier. which is 6, and multiply it into the apper number, laping 6 times 5 to 30, 3. write the o under the fecond place, and referbe the article 3 to be anded to the next place; then I fan, 6 times 4 ts 24, and 3 to minoe is 27, 3 matte 7 in the third place, and referbe the atticle 2 for the nert place; then I fay, 6 times 6 to 36, and 2 in minde is 18, the digit 8 3 1645 let downe in the 3.68 fourth place, and keepe 3 in minde : 8225 Againe, 3 lap 6 9870 times I is 6, and 3 kept is 9, which I fet downe, and fo 600425 days babe I finithed two multipliers, where fore 3 canceli 6 with mp Pen.

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Finally, I begin with the third and lat multiplier, laying, 3 times 5 is 15. I write; in the third place, and refer to the article 1, then 3 times 4 is 12, and 1 kept, is 13. I write 3 and keepe 1 to be added to the new place; then 3 times 6 is 18, and 1 in minds is 19. I write 9 and keep 1, the article; again

Multiplication.	83
9 fay, 3 times 1 is 3, and 1 in mines is 4, inhich	1645
a fet bolone, and	8225
gures frand as a. day	es, 600425 24
10 600425 dayes.	2401700
incouragement, be houres,	14410200
mought to prime The total is minutes. Prime minutes.	864612000 test 7 1500
the worke is very perfectly done; cells if you now node together into will be 600425, which is the gre	one fumine
fumme of that multiplication, and the number of dayes fince our Lord our his Incarnation, unto the envers, besides 407 dayes, and two	d and Savi-

Scholar. This is marvellous, mee thinke, but lach great matters may fo easily beent diebed by this Art, which heretologe I ever the 35t had been impossible, as insinite logis of people are of that minde.

Master.

Master. Truth it is, that knowled so hath no greater enemy then ignozance : for this is one of the least of ten thousand things that may be done by this Arc, as hereafter you shall be able to justifie.

Scholar. The manner of Multiplication

I perceive, if there be no more in it.

Master. Yes, there are other formes and help for ease, and shorter labour of the Work of Multiplication, but I will remit them till you have a little tasted Division, where also the like helpe into Division may be used: and so therefore under on example for both, Will I show you both ease in Multiplication; and also in Division.

But fifth the other formes and working doe nothing differ from these works in effect but onely in setting of the numbers, I will over pake them till a more meet place and time. And now will I instruct you in Division so that you thinke your selfe sufficiently to per

seive what 3 have taught you.

Scholar. Des Sir, I thanke you, but Idenot perceive how to examine my worke, to have well done, or no: therefore you promifed me ere-while, I pray you fit their me how I thall prove it.

Master. That is commonly used by the proof 9, as you learned before in Addition, saving the it differeth from that forme in divers respect

First, you must make a cross after this manner.

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Then must you examine pour famme that Proofe of hoald be multiplied and look tobat remaineth Multipliafter cafting away of 9, that let pon at the one cation. five of the croffe, then examine the mulciplier, and whatfoever remaineth in it after catting away of often as pou can write that at the other five of the croffe : then must you multiply those two numbers together, and looke inhat amounteth thereof, if it be under 9, waite at the higher part of the croffe : but if it be as bobe 9, then take thence o as often as pee can. and write the rest at the head of the crosse. As for example; wee will prove the example you put forth of the price of ground, that contained 1365 pards in length; and 236 pards in breadth.

Therefore first I cast away all the nines from the fumme to be multiplied, laying, 5

and 6 make 11, call away 9, rest 2: then 3" and 2 make 5, and I s 6, that 6 3 write at one five of be croffe, thus.

Then doe I eramine the Maliplier, which is 236, wherein then the o is cast out, there renameth 2: that 2 therefore I fet the other live of the crolle.

Then do I multipla 6 by 2, and it maketh from which 12 I withdaw 9 then refleth which 3 do I fet at the head of the croffe. en do I examine the grolle fumme, amount: of the multiplication : which is 3221409

where

where I finde 9 once, and 3 remaining; that 3 I fet at the foot of the croffe, and then I fet it both agree with the other 3 at the top of the croffe, and so know I that

I have done well: for if they two old differ, then were my works in bains, and the multiplication false.

2 3 6

proof, but the most certains proof is by vision, of which I will anon instruct you.

Scholar. Sir, what is the chiefe ule of M

tiplication.

A fure proofe of Multiplication.

Malter. The use of it is greater then can pet unberstand: bowbeit, thefe plaine co modities it bath, that if you would refolbe great and tobole value into many fmall leffe postions, as if you would change you into Millings and pence, or any other gre or fmaller parcels, by multiplication pee doe it speedily and easily. Also tipon the need to abbe one fumme to it felfe, on to other often times, you shall do it by mulciple tion much more speedily, readily, easily, furely, then by often and funday Addition Take you these commodities grolly the for an antiper at this time, and bereath will more abundantly make you to pero the nie of it.

I to

Divilion I to a morning

od editation (anda) e na odd lu a

Ell Sir, then in Division I pray you to instruct me. But me thinketh by the name of it, that it should bee all one with Multiplication: for I call that Division, when any thing is parted into divers

nd many parts.

Mafter. Pon take it as it is taken commonly: howbett it pon mark well, pon take perceive that it is quite contrary to samplication, and both not part one thing take things into many, but contrarysales, it bringeth many parcels into tem, a pet fo, that there tem taken together, are wall in value to the other many: for by dison, pence are turned into thillings, and llings into pounds: As for example, of 120 llings, it maketh 6 pounds, to are 120 turbonios, which is a smaller number; but then you consider the Denominators, you that see the are such, that one of the latter is all to 20 of the first, and so in value the instance one, though in number they do distances in division, bowbett; pet in the induces in division, bowbett; pet in the

A generall Rale for placing the beart.

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working, the fumme is parted by another, and

thereof both it take the name.

Scholar. I thinke I figal better understand the reason of the name when 3 know the ale of the work, therefore now would I glade learn that.

Division what it is.

Master, Division is a distributing of a great er summe by the unites of a leffer : Or, divil is an Arithmeticall producing of a third number in respect of two propounded numbers; who third number shal so often contain an unite as greater of the two propounded numbers can a rain the leffer. So that as Multiplication feem to ferbe in fread of many Additions, Division may seem to be in place of m Subtractions: Because that third num briefly etprelleth bow many times the le of your two propounded numbers man Indicaced from the greater: as in partioil more largely appears. Therefore (as may perceive) unto Division are requ three numbers : The first, which thouse be vined, and that must (generally) bee the g be divided, and that is (generally) the le and is called the Division : And the ch Mafte which and wereth to the question (How re ne ny times?) and therefore is called the tient.

A generall The first must be first written, and Rule for placing the second so let under it, that the last figu the lower number be right under the less gure.

the bigher, confraritoile to the work of othe kindes of Arichmetick : for in them the tim fire figures were let ever meet one under th others but in division, the last figures must b: fetmeet, ercept it chance to that the last figure of the divisor, bee greater then the last of the binbernumber, for then you hall let the last of Anex erthe Divisor under the last fave one of the bigh ernumber, as tos erample : wit 30 % it milliut

Hyon Grould divide 365 (which are the fumme of the days of a year) byat of a 1365 anshould mon Moneth, then should you dish a vodo fet them thus, sugarif sold is middle of thin so

6 dayes by 3 2 which is the unber of weeks in one reare, it as 1952 Likewife, if 3 month divide

elame 365 by 4, lubich is the moe of the quarters of yeares, muft 3 fet them thus strams 10 1000 offic

Scholar. Sir, this doe I underCand, but solv hould I so to divide the one by e other ? then the firmes a soul

Mafter. Dou mut begin with the latt fine nert the left hand, and fee how many nes the last figure of the divisor may bee en out of the last figure of the other ber, and that thall you note within a med line toward your right band to he cample. I would divide 365 by 28,

91

then

then let 3 thole two funtion 385 (C. Inidat

And 3 look hole many times . The said I

I may find 2 (which is the last figure of the divisor) in 3. (which is the last of the number to be divisor) and considering that I can take 2 out of 3 but once, I make a crook line at the right hand of the numbers, as within it I set 1, and that is called the Quotent number, as I told you. Then because the when 2 is taken out of 3 there

Quotient number. when 2 is taken out of 3 there remains the 1. I must write that 1 I ober 3, and beface or cancell the 365 (1 3 and the 2, then will the figures 28 stand thus.

Then come I to the next figure of the visor, and take it likewise so many times of the figures that be over it, and look to both remain, that I must write over the and cancell them, as in this example.

Therefore now do I take once 8 out of and there remaineth 8, which I must fet the 6, and cancell or cross out the 16, and 8 of the divisor: and then will the figures stand

then wil the ngures uand thus. And so I have once inconant.

Scholar. So I perceive 355(1)
that you take the nether fi. 28
gure, not onely out of the
other that is right over
him, but out of that with the other also

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ga ber

tha tho cen Quant remaineth before, and are incitten toward the

Mafter. So must you do for you must so take the Divisor out of the over number, that there remains not over it so great a somme wit selfe is do; then were your works in pains, and the selfe is do.

But pet againe bere muft pou marke, that when you feeks bow many times the last fisam of the Divisor map be found in the number over bim, that you looke also whether you map as often finde all the figures following in de that are above them (confidering all the remainers, if there be ann) if not, take pour Quotient leffe by one, and then probe againe. in fo fill till pon finde a meet Quotient : and by that meet Quotient muff pon alinapes miliply pour Divisor, and let the product unpour Divisor, to that the first figure dand per the first figure of your Divisor, and the tond unper the fecond, and fo forth and n labtract that product from the number to blotted that Candeth directly over it, as habe feen me donner and and the

Then you have thus wrought once, then must you begin againe, and write your Divior anew, neever toward the light hand by one place, as in 28

der 8, and 8 under 5, thus. 288

Then (as before) feeke to many times you may

1) 3

take

the your Divisor out of the number over him

now.

Stablin What may I be bere 4 times.

Maker Wrathet is, that you may hadd four times in 8 but then marks whether parties the figure following to many time can know that is open him. Can you finds But pet against loss results par upints since

Scholar, po melther pet once. 300 1104 1150

Malter. Therefore take 2 out of 8 on over bins, that pay labite also labeller, and

Mikar. When then, 3 times a make 6): he take 6 out of 8; there remained 2.7 100fch with the 3 following make 25, in which the 3 finde 8 spice times allowed life life of a and specestic Frake 3 no a 2001 lating of the true quotient, and write it vict ground will within the crooked line of housed mog the quotient before the rush 364 stripp tond ungestige fedoret, erne to logie i ente

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Man

n fobtrag that is semil's if garmona minks 6, then cout of 8 feel paid contain feth 2, therefore 3 cancell omeras a dad me B, and write over it the soud now not me that both remaine this firms night nor do

Then do 3 take 8 as many fines out of fapting, 3 times 8 matte 24, mio if 3 tate out of 19, there remaineth 11 to then 3 cant 25 and 8, and over the 5 let in thus in . 8 you

Casta tes Insell gam nog pomily gamm q

Mark how to confider this kinde of Remainer.

3. (4)

Mafter, Can enog ierne) togini nogude formtig tobe wat quo genty (A al fing let) 10? Araightway babe multiplied him 78 to 30 to tobele divisor us by that d 265(15 which lieting fet unber 284 11411 288 and duly fubtraced from 85 and radio at 12 of the mimber divided, growth 1, the remainer of the tobale division and beroje von ban. Morke which way you lift, here ben fee alfo Man their mail: I tooke hate of Complete Andrew have I wine with the bisions

in score die 8 s solvid ger sound torman it was Scholarogan, except you would part the r

that semminetty into a 8 parts, and it and sure

Malter. That is well fait and is must we do in fuch cales, when there remainsth any thing: but 3 will let that palle now, and will make you perfect in division of lebote numbers, and will bereafter teach gott parfieu. solvet pour or perceive the order of division, then bor you divide this fumme 136180 by ter over them, so fire 3 ang, a timpet

Scholar. Firth, Bolet botone the mumber that thould be divided, then bo I fet down the divisor under the last figure of

be over number, Ahen will it 13 6280 the thus,

Tap likefolle, a timed a make diaffer ered one Die ino en 1 E Mafter. Master. Can you take the last of your divifor (which is 4) out of one, which is the last of the oper number

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Scholar, I had forgotten, because the late of the divisor cannot bee taken ont of the date of the oper number, in so much as it is the Areater, therefore must I along the divisor one place in 136280 and more so ward toward the must be said and tright hand thus.

And then must I looke how often I make supposed the druffer (that is a in 19, which I may be actioned, therefore be I say, a times 4 is 12, which I take out is, and there remaineth a Thembox I make at the right hand of my summed accroaked the and inside before it my Quotient 3; and I cancell 12 and 4, and ober in the analysis of the 3 I set the rethat re-illies since it makes the matneth, and then the set illies since it makes the set of the set o

Then I multiply the same Quotient to every figure of the Divisor, and twithdish the summe that amounteth out of the numbers over them, as first I say, 3 times make 15, which I take from 16, and then resteth 1, I cancell there to 12 to 16 and 5, and write 12 to 16 and 18 and

Then doe I say likewise, 3 times 2 make 6, which I take out of 12 and there reacts 6, there

therefore 3 cancell the 12 276 and the 2 over, and then 36280 (2 I wite the 6 that remain 1452 di shound self tras in that

Then Chould 3 fet foza de E 226 000 1900 men the divisor into the = 236280 (3) nert place toward the right 11 14922 band, thue. an d 45 ue mariet in the second

Mafter. But pon map fee that over the 4 is no figure, therefore 3 must fet the divisor pet forwarder by another place and anoth under

and marke, whenforver it chanceft fo. hat you hould let forward the divisor, and hat it cannot fand there, because there is no umber over the last place, or if there be any tis leffer then the last figure of the divisorit den must you remove the divisor pet once as ning ferbed not to subtract him so much as to therefore you thall write in the quotient cypher, and if you thould by chance need to do all times, for every time write a cypher in equotient. The reason of this will I shew Meller isoprofis of the reef instance

Chalaca Then mult Ireft cel staided at ing fummes thus. and no fear day degrand and because I removed 19236280 (30 divisor, to that 3 operands 4522 191100 3 3 wed one place, 3 muft 49 le a cypher in the quotake us and then mult I h 6, at a new quotient, as

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Divit

in this example I materit floring & ocolors fay : How many times this down as soil of 4 is there in 6? (and (1 and) 263 altrul fith it can be but once) therefore boe 3 witte i of 6 4322200 to the quotient: and and rollings to the then fap 3 is time to continue and continu taken out of 6, remais meth 2; 3 cancell the 6 m sey had rathely and the 4, and write 2 desail, store of ober them, thus sain the loan to 195 1865 col

Dien fay Bagaine, oder of the dul once cont of 28 temate 2263 meth 234 3 let the 2 1 00 236208(30) fund as it old and ober 4 50 45222 300 that 8 3 let is scancellat all ASS mall ling the 8 and the sun's dome no \$ 2 nm thand because that his the sand onn't

Mafter. Doumfahfas tool babe fait. yout of 8, and to comaineth 39 but now mer, and if nou then to be chance worship

ni Scholar. Then once i ant of o cannot most chall 3 mole doe 101 Stue direction

Mafter. Bostow of the nert miniber is behinde (for there is 230) and doe as learned in Subtraction in a like cale.

Scholar, Then mult 3 borrow I of 3 comming behinds next, and make the dictal Energy and Is

their med

A decision can

out of ro, and then take I2

out of ro, and there refleth

8 and because I borcowed

one of the 3 I must cancell 236280 (367
the 3, and write 2 over 11, 1452222
then both the figure stand 145301

Maker. How have you done, and yet remained 228, and your quotient theweth you, that I you divide 136280 by 452, you that finde your divisor in your greater number 301, that is OCC times and once, and 228 remaining.

And in the other example (where I bivided 163 by 28, the quotient was 13, and 1 remained whereby I knew that in a year (which intaineth 365 dayes) there are 13 moneths, ethoning 28 dayes (or 4 weeks) just to a toneth, and r day more.

Scholar. Why then doe we call a year but

Miller. Of that at a more convenient time ill I fully infernat your but now it is not identified to intangle your minds with other market their dos directly pertains to your mater. Therefore it you remember what you be beard, you have learned a thort manner Division, which I would have you often to tife, so that you may be perfect in it, and taken I will them you certains other propositions touching it.

Scholar When I pray gon tell mes how

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I shall examine and fry my works, inbettor I have done well or no that though no mu be by me to tell me, yet I may perceive it my felse.

Proofe of Division,

Malter. Some men (yea and common most) doe try it by the rule of 9, as in all to other kindes, save that their order is; find they cast away 9 as often as they can out a the divisor, and that remainsth they set one side of a crosse, as in our first erange the divisor was 28, from which you may take 9 three times, and it remainsth which is remainsth; which they set by

a Croffe, thus. Then they like wife eramine the Quotien (which in our example is 13) and from the they calt away 9 as often as they can, the remainder they let at the other fine the Croffe, and then they multiply toge those two remainers : and to it that amo eth they adde the remainer of the Divi if there were any, from that whole fun they withdraw 9 as often as they can, the rest they let at the head of the Cu as in our example, the quotient is 13. fi which take 9, and there remat. neth onelp 4. and therefore 48 mult you let 4 at the other ... five of the Croffe, thus: Then multiply 4 by 1, and it peeloeth thereto adde the remainer of the Div (which was 1) and it will be 5, which fun

noth not amount to on and it find to therefore must be fet whollow 4 VI at the bead of the Croffel and poulee here. Mis e asials and Tribase

and this number on the head of the Groffe is the first proof, to which if you find another like in the number that was ofbided, then pour have none well and of stances I med

Therefore noto thall you likewife eramine the tohole fumme that was othibed, and take away o as often as you can, and that that remaineth, fet at the foot of the Croffe: and if it be equall to that in the bead of the Croffe then have pou done well, else not. Il simmed of

Ag in our example the tobole at 30 5 mod so fumme was 365, which maketh 4 14, from that take 9 , and there reflethis, which fet at the foot acong sil die of the Croffe thus. a secured and senial emet

And you thall fee that they agree : therefore tiele the enotione. Inside the state was

Bow will 3 likewife eramine our fecond maple, where the divisor was 452, which maketh 11, from thence I take 2 d and the 2 that remaineth 3 fet at the right five of the Croffe abbo to the Lamme wind

Then eramine I the quotient, which was or where I finde but onely 4 2 that I fet at the other five the troffe thus,

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2, and it maketh 8: to that J. able the to mainer of the dividua (which was 228, and maketh 12) and they tive make 20, wherein J find twice 9, and 2 remaining 1 that 2 mail J. 442 fet at the head of the Crofic.

Then I examine the tobole line and and numberato be divided in thick account the use 136289, inhere I finde 4 2 thice 9 42 remaining, which 2 1 is a feet at the foot of the Crosse, and distribute thus:

And because it doth agree with the figures the head of the Erolle, I know that the divion was well wrought.

The proof of Division more certain by Multiplication.

Mafter. This is the common proofe: How beit, the more certain working is by the cotrary kinde: as to prove division by multiple cation, thus:

Pultiply the quotient by the divisor, a if the fumme that amounteth, be equal to a fumme that should be divided, then have a well divided; else not.

Powert, this must you mark, that if the remained any thing after the division that must you above to the summe that mounteth of the multiplication. As in a first example our quotient that 13, and divisor to 28; Pow multiply the one by other, and the sum will be 364; to that if adde the 1 that remained after the division above the 1 that remained after the division

then will it bee 3653 which was the fumme at thould be divided : and therefore I know that a babe mell bene wills tour after hem sell

Scholar, Row will I prove the fame in the fecond example, whose divisor was 452, and the quotient 301 : the le bo 3 multiply toge: ther and there amounteth 136052: to which if appethe 228 that remained, then will it te 196280, tobich was the whole fumme to be ofbiged a and therefore 3 perceive that 3 have well-done, the of each of one come not had

Mafter. This is the fureft way, to eras mine Division by Multiplication, and contrarts wife the farest proof of Multiplication is by Divilion. s and E Thought a time ? Hounts

and therefore (according to mp. promife) now will a thew you bow you may probe

Multiplication by Division.

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When pou have ended multiplication, and Proof of bould know; whether you have well done or Multiplinot, let the groffe fumme that amounteth of cation by be multiplication overmost, and divide to by Division. be multiplier : and if the quotient be the fame number that Choold bee multiplyed, then have on well waought, else not, as in that erample bero we multiplyed 264 by 293 the graffe place, and feet a sale anorie 5666 and

Aph if you will know whether that multisation be true goo shall divide that 7050 bit multiplier 29, and you that perceive that quotiens will be 264, and that to a token gon babe well wrought at Fit tol : insug remaine

Scholar

Scholar. By your patience I will probe that, and first let bown the groue summe and the multiplier, not after the rule of Multiplication, but after the rule of division, so, now that number is become the divisior, that was before the 7656 Multiplier, I should set them, 29 1002 therefore thus.

Then shall I feek how many times 2 in that may be three times and one remaines but then may not 9 be found so often in roll therefore usual I take a lesser quotient, that it o say 2: then say I, twice 2 maketh 4 which I take out of 7, and there remaines higher I cancell 7 and 2, and over 7 I 3 write 3, and in the quotient 7656(2) I set 2: so the figures stand 29 thus.

Then say I surther, 2 times 9 make 1 which I abate out of 39, and there rest 18: then cancell I 3, and over him set 1, and likewise I can. 1 cell 6 and 9, and over them I 38 set 8: so that thus stand the 7656(2) Figures.

Then I let forward the Divisor by a place, and seek a new quotient, that is say, how many times 2 are in 18, which finds to be 9 times: but then can I not say so many times in 5, therefore I take alser quotient, as to say 8: but yet that is great: for it I take 8 times 2 out of 18 the

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remaineth but 2, and 3 cannot finde & times 9 in if : fierefore pet 3 talte w telle quotient, that to 7, which is also too great, for if I take 7 times 2 out of 18, there resteth 4, but now 3 cannot take 7 times 9 out of 45, therefore per Been lefter quotient, as ville and te to fay 6, then fay 3, 6 times 2 26 make 12, that & take out of 23 Bymid there remaineth 6, fo 76,6 (260 11 3 cancell 18, and the 2, and 29) wite over 18, thus : and gould good of one Then lap 3 forth, 6 times glad all samura grand there remaineth 11, 28 m andiv no the figures thand thus: 1381 381 01 0118 When mast 3 fet forth the 7656 (261 04 livifor again, and feelt a new 299 amid notient, which will be 4: toy 2 2 2 bough I may finde 2 in 11, 5 772 In charge; mes, & 1 remain, pet I can: 381. Can difind 9 to often in 6, there 7656 (264 te I let the Agures thus : 010 2999 and the 4 to the quotient il 22 das not all losle maltiply into the figures of the Divisory ping, toute times 2 makes all 2 1000 which I take out of iri, and 1263 in any gift te tella 3 therefore 3 canadigationers dus the 11, and the 2, fet 3 0 7653 (2640) the first place of 11, thus: Lagga olad en and then do I fay forth, 1 22 1 and no mes 9 maketh 39. which e from 36, and there remaineth nothing,

B

But There is a self-

Cothat the quotientest this Division all (where 76,6 is divided by 99) is 2641 Which both bectare, that if 264 be multiple ed by 29, the summe will be 76,6. And the I perceive now how both Multiplication is proved by Division, and Division also by Mal

tiplication.

Master. Poin have I enved the sive comon kindes of Arichmetick: Fo2 (as ton ing Mediation, Duplation, Triplation, such other) they are no severall kinds of richmetick, but are contained under the ther. Fo2 Mediation is contained under Distriction, and is nothing else but dividing by and so are Duplation and Triplation contained under Multiplication: so, Duplation is thing else but multiplying by 2, and Tripla on is multiplying by 3, of which I will on propose an example, so, the rules you beard already.

An example of Mediation. If you would mediate, or divide into 2,6 fumme 453 1010, you that let 2 for the d for, and work as you learned 45310 hefore, as thus:

Then I finde 2 in 4 two times, then my quotient must be 2: so I cancell 4 and and remove the divisor sozward thus, as work requireth and as before in Division 4531010(226) on hath beene doclar 2222222 ted.

mibith mediation of division by 2 mil

initied, you thall have for your quotient Duplation. 2265509, mbich is the halfe of 4531010, as non may tree by duplacion; for bomble that prient, or mustiply it by 2, and the fame ber will amount.

I will no longer tarry about thefe, feeting the are but members of the other kindes. But ment (according to my promise) 3 will teach sou certaine eatie formes bothof mulciolication and of division. And first of multiplication.

Sipon would therefore multiply my fumme Hafie 10, pour figali need to be no more but abbe a formes of pher befoze his fieft place; as for example, Multipli-6 multiplied by 10, make 360.

Likewife if you would multiply any famme 100, put two cyphers at his beginning. So would multiply any famme by 1000, thee cyphers to the beginning of it. Scholar, This bo 3 well percetbe, and also

walen of tt.

Mafter. 3 will omit all reasons till our next ling, tuben 3 thatt tell pon the reason of all parts of Arithmetick allo : and as to our rnow, took, as 3 have told pourthat pour temember it, and also often partie it.

know you have learned both to maltitality by 10,100,1000: and of like mann on bo with mp other of like fort.

note if you will multiply by 20, 30,46, toth, or by 200, 3000, and fach like, there is one cypher in the first place,

cation.

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or many orderly in the first places, you shat take away those cyphers, and multiply the summed onely by the other figure, or figure, (if they bee many) and then at the beginning of the summe that amounteth, you shall set many cyphers as you tooke away.

Example of 2873, which I would multiply 300, First, I omit the 2 cyphers from multiplier; and I multiply the summe by the onely that is lest, and it amounteth to 861, before which I put the two cyphers that I fore omitted of tooke away, and then is 861900. And that is the summe that amounteth when 2873 is multiplied by 300;

Scholar. And if there were two or m

figures beside the cyphers, I must onely to away the cyphers, and multiply by the of figures, as I learned before: As it I wo multiply 93648 by 25000, I should take way the three cyphers, and multiply the subject, and then at the beginning of that to summe should I adde the 3 cyphers against

Master. Even so: but if it chance then ber that should be multiplied, or both summes, as well the number that should multiplied, as the multiplier, to have cypin their sirst places, evermore omit the cypand work by the rest. But remember to reas many cyphers to the amounting summer hated before, as in this example: 30 shall bee multiplied by 206, I shall a take away two cyphers from the

ter number, and there multiply 302 by 206, and afterward adde the two cyphers againe. But if I bould multiply the fame 30200, be 1060; I thall not onely take away the two cuphers from the number that thould be multiplied but also I may take away the me cypher from the multiplier, and then mb dabbe three syphers to the fumme that montetb : but take beed that you take aimay no cypher that cometh after any fignifying gire, as in the last grample, you may not the away that it in the courth place of the ligher number, naither that in the third place of the multiplier a hotobett, get thus you may at If one cypher or more tome in the mion from fums, you may multiply by the other fither, and opership them : but fo, illied and pou give every figure his due 4326

ine as thus, I will multiply 2994 as by 2004, therefore A fet 172104 is multiply.

yp yp tel And thus I doe multiply them. First 4
med 6 make 24, I set the 4 under the first
wand, keep the 2 still in my minde. Then
II againe, 4 times 2 make 8, and the 2
tis in my minde maketh 10, I set downe
cypher 0, and keepe the article 1 in my
inde Then 4 times 0 is 0, and the 1 in my
maketh 1, I set downe the figure 1,

tiply it withal) I put it down next in i Constitution of the Control of

fifth place.

But note tohen & come to the nert s (being a cypher a) 3 let it go, because it tiplieth nothing, t likewife the ferond cypi

But then, when I come to the stant tiply teento the 6 of the over number, sunft take been (according as I thing be in mulciplication) that the first number mounting of the multiplication the let right inder the multiplier, and the other orderly tomard the left hand, according as 1111 3 TA you may fee in this example, Gogs which being finished, with the aboution thereof gatheren toges 606 ther, will fand as this example webseth.

withich is invert topongotife 1 026 much the foother and thouter by 2004 over-shipping of the two cyphers: which otherwise (if the 1210) fame example toers torought at occo length) it would have had the seco toothings more, as by the fame 6052 example here also set bown both 6064104 ppear.

Scholar. Dir 3 fomit gen, for 3 fee eafe in this way of multiplication : an you can theto me fuch like in division) you areatly further me.

Malter. Des, I will teath you fome eatie Easieforms to be for division also, and first this : It you of division mould stotbe any framme by to, you mall one. with your Pen make a fquare line bettoeen first figure of your famine and the fecond, then have you obner to, the whole number followeth the line, tranbern to, the quone and the figure that is betwee the line, is Remainer: As for example.

648 olvived by 10. Eathere is the quotient, and beto-

eth that fo many times are 10, in 3048. with 8 after the line is the remainer, which amot be ofvices into 10, but by breaking it Mofractions, wherewith I will not meddle

and to like wife it you would broide any time by 100, with point pen you hall cut thinks two field figures, and the tout a the by 1000, you must cut away the type figures, and fo of any other divitor, topole ligare to ratio the other cyphers, look boto merphers the divisor bath, and to many he at the beginning that you cut away The remainer because they are lette then the ivifor, and cannot be ottother by it, and the oligures that are behinds the little trand to, otient,

t now if your divisor have any other m his last prace then 1, and in all his places babs cyphers, took bow many cyphers

cyphers then he, cut amap to many of the figures of the number that thould bee diplos and attains the rest that followeth the line he foat figure that is in the last place, as it were the inhole divisor.

were the inhole divilor.

Example of 64.24, inhich I mould his by 300, here must I cut away the time in figures, (for something cyphers my divisor had and must divide the rest by 3, inhich is the gure in the last place of the divisor, I therefore I part away the time

befb thus:

Then doe I divide 642 has, and the question to I finde twice 3, and the question in 6 I finde twice 3, and once, and I remaining, which I with the 2 m before, dothanake 12, soberein I finde 3 to times: And this is a ready way to turn a linus into pounds: for fith one pound contain 20 billings, I must divide the information of shillings by 20. Therefore, early if. I see that imposition hath one symmetry is and therefore I cut away one figure from heatining of the whole summe of shillings, then I doe mediate or divide on 2 the other gures or summe that followers.

Scholar. I will put an example.

Af you would oftime 64.87 in illings, 20: that is to lay, it I would turn to me shillings into pounds, I must cut away first figure, that is 7, and divide the rest, it 64.8 by 2, to shall the quotient beesee where

whereby I know that 64287 hillings make 2214 pounds, and y Willings remaining.

Malter, Bow probe by muleiplication whether pour babe well bone po no diamismen latt? Scholar. The quotiene is 1214. which 3 me multiply by the divisor a and it both to mount to 6428. freth S. fabich then take dut

Mafter. Dereby you may perceive not one. ly that pour bave well done, but also both by when you may turn thillings easily into pounds: and contraughtife be multiplication you map turne pounds toto follings, dans

But here shall you fee amongst divers men divers forms of fuch division; but if you mirke what I have told you I you thall perceive easily all the ivater. For some men do not cut away to many of the first figures of the summe that they would divide, as there an cyphers in the first places of the divisor: but they set all their cyphers orderly under the places of the number that they would dis manner a : and then with the other figure or figures of the A-Aftere be many)they Dibide the reft, of their bridgemme, ent, ment porte ment,

日本日の中国中国中国中国中国中国 10日日日

ere

there:

simple: If they month dist is 1725931 their fummes thus: some earn't sord's dail and then do they divide expenty till they to the expheritanthere they frap and beir aport, as in this example in a dan ! bepaceke bow often 3 may be found in with is two times grand a remaining:

r

7

9

lo

cut away

Herefor they let a knithe diam is guarada

Then boe I gos forth. Taying, two times 4 mai 224 lollion a keth 8, which they take out 725931(2) of 12,000 there commissed 346 obit 4, thus:

Comcemore they the divisor for tontonto, feeke boto often 32 may be 110 5.18. 4 80 mg
found in 4, which is but on wantigsmall
once, and a remaineth, then days out 2.20. let then I in the quoti- 7259 \$1(25 chit, and cancell 3 and 4, 4 1344 oo sill ober thom they fet that t, gardinas adi thus will be to be

Then take they once 41 1641 smmul out of a smito there refleth so rat and wa ir. Op elle more eatily : 17 745931 (2) take once a out of s. and \$344 68 814 there restoth tife thencents at godt das: tell the 4 and 5, and let a forman od aball over them thus:

Then let they forth the divisor again, seeks bow many times 3 are in 11, subich finde three times, and 2 percent and 21961 maining: To they fet bolin of 22 mod 1 an the quotient, and concell 1 242 octo) 1 1 and 3, and ober theresets 729931 (219 2, thuse 1910 1934440b900 Then doe they matte 233 at 1910

oly 4 by 3, which maeth 12. that withouato they out of 29 and there refleth 17, of which the be fet over the o, and the I over the 2.

728931(213 344400

Am now are the two cyphers next infaire. to that the divisor can no moze be fet fortware. no merefore is the division ended, and the remainer is 1731.

Row the quotient which is 213, both bethe that if you divide 725931 by 3400, you hall finde it therein 213 times, and there remaineth 1731: fo thall you dinde it, if you whe as I taught you, by cutting away the mofirst figures, because of the two cyphers.

But this must you marke (as you may per- Note. its by this last example) that if there bee time other Remainer in the fumme that behinde the fquare line, that the Romai will be let to the latteriolists and gives

was cut away with formere line : as if you mb divide 725931 by oo, after the forme that mght you, then would fummes appeare .

7288 31(213

that 17 which remaineth after the lines

line, must be let to the 31 (that was cut not may with the line) in higher places, as posses bere where that 17 with the 31, bo make 1731.

Scholar. Str, is there no other forme of

Master. Des verile, there are other forme in practife, but because I love brevity I will declare onely one, which I first learned of and is practifed by that worthy Mathematician, my ancient and especial loving friend master. Henry Bridges, wherein not any on figure is defaced or cancelled. As if I should divide 72 by 6. first place them thus.

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whe as I taught on slashe too and and and the gran nog the first taught of the district of the

that it may more easily without cancellings beforing of the work be applied to, and number from the dividend at pleasure; the apply your divisor sto 7, the first figure of the dividend, and inquire both off it may be bad 7, and feeting 6 is but once in 7, let a single quotient line thus single as a single should

Then multiply the 2072 6)74(11 dla divisor 6, by the quoti-saire) self sairs of ent 1, and let the pro- mod sair domi duct 6 under 7 thus sair gos 6)72(Lin in

Then draw a line 6

Write the Divisor in a loose paper to remove at pleasure.

Carrie.

6 out of 7, fetting	6)72/43 7 9010 0
the comainer i un-	wied the free free
per 6, thus:	tions by and the district
Then bring down	under 75 map ler bold .
the next figure of	eff to is there done,
the dividend, and let	6)72(1
it with the Remai-	
neurander the line,	tet the product 2 miles
thus:	end it thus.
And in the mobe	6)72(12
able divisor bunder	forme couple of the
the 2, and as before	if the the Memoir ?
enquire bow oft 6	in the medical train
ts in 12, and finding	'- 5 042 70 dens. 693
it to bee twice in 12,	vifor 3 c thereto, on-
fet 2 in the quotient,	di comile med amp
thus:	das det al gentetnos

And multiply 6 by that new quotient 2 letting the product 12 moder the other 12 mid labouring it out of the upper number, there restet having. And since the unites of the product bo stand under the unites of the division is ended: other wife you hould proceed as before, bringing downe the multiplying, subducing, ac.

Scholar. This is very easie, but if there he water numbers propounded, is the operation wante

Malter If the numbers bee never to great, be worke is the same without any difference, will appears by this example.

Divide

First set them thus, 33)7899(2) then bying the divisor, under 78, and see how off it is there found, which is twice, and therefore set 2 in the quotient, by which multiply the divisor 33, and set the product 66 under 78, and subbut out of it thus.

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23)7890(2391 Then bring thenert . figure o down, and let 66 it with the Remainer 129 12, it maketh 129. 99 and removing the divifor 33 thereto, en: 300 quire bow often 33 is 397 contained in 129, and I finde it but thaice. (though at the first it

made a them of moze) therefore let 3 in a quotient, and multiplying 33 by 3, let be product under 129, subdusting that product of the number above, and proceed as loze.

Then thall pour finde the divisor of the fin the Remainer, therefore feeting of the quotient, multiply, and subout as before, at the last you thall since only 3 remains topich must be set above a line after the quotient, and the divisor under, as above applicath.

Scholar. Is there no more difficulty

the whole Role of the will be mionis

Malter: Bob any, although your number bee never to great, an before 3 babe faid:

Andhera will I make an end of Divili-on favong that I doe request you to arercife you falle well herein by many fammes, till a hape attained fome expertmelle therein-)

Fantbereafons and constations chareof are fo may and fo available for all forss of men whatfoever; that if I should freak of the infinite uses thereof, I should ranber tack words then matter. And therefore recommending it to your judgement bereafter, upon your further travell into the Art. 3 will here end this Treatife representing unto you pure example, or simple queltion of Dividon and Multiplication, in head of many, which is this this in a fair to and

These are fonce braffe Peeces: The first of A question thim at a fact frenders spounds of powder, of shooting he fecond spendeth I pounds, the third 4 in Ordpoinds, and the fourth a pounds. I bep are appointed against the pattern of a Hold, there is allowed by the spatter Gunner founds of pointer to be frent by these four coninchis alland. Thequestion is twofold. felt both many bot each Perce thall the make shout with this 700 pound of wden? And lattle hote many pounds of ider ought infile to bee allowed to each pounds, and to the not coport and to to so Scholar.

Scholar, Why Sir, you make me Inite, to beare mee in band, that there two bemands may bee simply resolved by Multiplication and Division.

Maker Truly that they may, and that you may by and by worke your fette with a little labour: If trul adde together their quantities powder, that is, 9 pounds, 5 pounds, 4 pound and 2 pounds, all which make 20: Divide the 700 pounds of powder by that 20, and you quotient giveth 35, as here appeareth, which theweth 100 mole certainty that they 10,000 and 10 make just 35 shootes 1 code (35) and shout.

Scholar. Sir, all this have a lite and inches and I done, and I fee to to, but whother the true or not, I cannot tell and a cannot tell an

Master. To try the truth of the same, in tiply the sirst peece that spends 9 pounds by and you shall see his allowance, which is 3 pounds of powder. Multiply also the secon peece that spends; pounds by 35, and you the sind 175 pounds his allowance; then 4 by and you shall sinde 140 pounds his allowance; then 4 by and you shall sind pounds his allowance. All which 375 some particular summes you shall sind appeareth, and it maketh just 700111 70 pounds, and so is the question true of pounds, and so is the question true.

Scholar. Ernip Sir, thefe ercellent conclu ions do wonderfully more and more make me hlove with the Art.

Reduction und refreit of their the sichlandland smell the more you thirst to goe on for ward. Rivery such a Fountain, that the more you brain, the more you. thich is should vation of our foules), there is no andp in the world comparable to this, for skill hereof is ivell knowing immediately -ob shore nomination and dome of dome in stimulation between of appropriate bath areaten the ferinage and infirmment of his praile and lings) is a groffe decomination for it ing the bricograme and to be the long threinis therefore I purp gon ceale not fa infirma ther in the wie hereof band q mail relief the further afont these two latter that diplication and Division 3 will being of the feat of Reductions of the most to it be lever (fo that many of them are other) then are then called the lubelled minations t tobereby pour may perceibe distribute matten a grolle a grolle nominations and a fluiditie (total la to great and fmail) in Divers comparifonds thillings compared to pennos, are a lubil finall denomination : but compared to

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Divilion. Scholar. E. cale Sir, tipfe ercetlent corclu am alam aram on Reductiones would et anel alone with the Ar Dedaction wifey achichial fammes geoffe dedoublesion mai With ad with funde sith more fuballi book alcook - And: contractor all tultures abjubrile denum Confidence Wought to fammes of groffen Große de Gri Mangaust Brittenschlaution Pour Hillian nominatio. tings) is a groffe denomination: for it is g his o and containeth insin teen with a militaries of and contained to their state of the contained of the contained for their state of the contained the contained the contained the contained their cont

white it be greater and containeth

crogination may be called a groffe

of them, it is a graile decommanding to
it be lever (to that many of them are in
other) them are they called the subtile de
minations to bereby you may perceive

nomination, and also a subtile (that is to fa great and fmatt) in divers comparisons.

finall denomination : but compared to pe

Subtile denominatió

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Reduction I

what it is.

they are a geoffe, or great thenomination inde Scholar. Bow & unberfanto the manue 18 in furth It eduction pasheet am dast not plus minder The utelle each learned, if contre To minder to par you have learned before from grand donumerion beto w fumme of a doubler of sublante elles detro miniscion, i più mall camboer boto Desthat lubriler denomination bos wakes deallog my a university out do poer mention of he form : Ant poul would reduce 19 orpounds i into duisgen mine confiner statistica people dresing Mobiler abjin o'three anihmmount 40 of tele glamate tendwithat imae pounds are then 4661 history to A the tothe day and dremute po fhillings intorpenso, confident It (he gillitting are tra pance, spon much design is adding the still be a downwhereby ap men that it you had his distance contain es perice. And thus may thureduce any denomination anto ambe fibrilet, by dicacion iff pon know how many of the boe make the greater : of which thing ? brigthe pool wibstite Table for the most the knows of Money; Weights, Mire Time, and fach title : tobereby pone win to woften each lybride denominate Contained in the geoffer, which you shalt for the the theath whinder of Reductions lfo the farite that ferres pour if you soonid B 2 reduce

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course any furnish of a fubriler denomination into a forme of a greater denomination. in Inch Reduction you wall consider (as in other forms) beto induce of the smaller be me the greaters and by that number you much vive the other famme, and the quotient tolk clave beto many of the greater denomination colon ; semma, tadani denestration su ample . If you bould knote boto many a large are contained in 3 240 di confiper it 12 ponte bot make i so per mate divide it 2140 bp 12 and your quosicat will be a inhereby you know that for many chillings in 3240 d. Burif you would know fact how many position are in their 270 shill in feeing that overy your containeth do tings: of other fast 170 by the siene it will be and 10 remaining, whereby you may that the \$240 d (0) 270 Willings) are pointed and 10 Willings For everyone regrainer mult be named by the name or de mination of that famine that was gold which in this place were Gillings. And min pour oce with any other kindes of D minacions 1 del le : us kena all effert cod

certaine light of knowledge in most some coyns, weights and mediares, (which is shiefe and principalles thing in traffick in known) I have in each Reduction, as a come in order, let downs certains instrumentalises thereign and a free I have bereat

not onely our current? and common counes, but alle the most part of the usual counes of Christendome, with their full weights and value current in this Realme of England, intending at the latter end of my Addition to this Booke, to write of the ordinary Money used in divers places, and their common value current for traffick, with the manner of the exchanges from place to place &c.

their,	exchang	es from	place	to place, &c.
學是學		0	-01	10018 200 Land
	Life Town			Dougl's Sourt. K.H.
CONTRACTOR I	221201	Conduction of the conduction of	100	mound Soo. of De.
	150	55 1	1	Ryall
	8	.5.7.	4	Half Koyall Bore
8	41	à	The Assessment	Old Noble
1	7		1	
0	41	8.	7	Amg
900	. 21	9:	1.	Dogn't Hote
dott	S. Sin	5	5	Silare
TO THE	4	11	1	spiris of Salute.
40.0	1 X 1 -	0	K	Achree Neble.
0.00	Control of the Contro	121	I	Haffe George Noble
bu.	6	6		First Comm K. H.
1	7	0	2	Safe Lyason K.B.
8.000	II.	- 41	2	Sever. K. H.beft.
86	11.	0	1.	Suberen K.H.
80	11	.5 71	1 8 11	Edward Saver.
1300	11	.b 71	1 5	Elexabeth Sover.
0.000	157 14	0	1	Elizabelli Eronni
The second	17.50	ber .	0	Half wromm.
	WALLEY.		1201	Vonte + Th

A Table of the names, and now valuational the most usually Gold-coyen throughout the Gendome, with their severall weighted.

Gendomen with energy what they're?

The Pence and Grains and what they're?

The lare worth of current Eng ill money this suley prefent year, 161 on a second prefent year.

Themsines & sicles		weight in	13 The	
of the Gold	Peng	Grains	Shil.	Dene
3517 e	a posicio	Aun 3 sa	an alox	YID
Great Soveram,	10	0	22	-
Double Sover. K.H.	8	1	23 2 2	0
Double Sov. of Q.E.	7_	7	22	0
Royall.	4	23	16	6
Half Royall.	2	Y.d.	8	3
Old Noble.	4	6	14	8
Half Noble.	1 2	3	7	4
Angell.	3	8	11	0
Half Angell.	1	16	5	6
Salute.	2	5	16	110
2 parts of Salute.	1	11-40	4	7
George Noble.	13	0	9	90
Halfe George Noble.	1	12	1 4	110
Fuft Crown K.H.	1 2	9	6	110
Base Crown K.H.	1 2	0	15	6
Sover. K. H. beft.	1 3	14	111	8 ok
Soverain K.H.	1 4	0	PI	0
Edward Sover.	1 3	red.	111	
Elizabeth Sover.	13	It d.	11	0
Elizabeth Crown.	132	0	5	-6
Half Crown.	0	Ig d.	7	334 50
Vnite.	0.00	Section States		-

Debble Crown.	10	16	oh It	The Run
The Comme	kuidið	-	100	roba.
Half Crown.	01	0 19 d.	offe	Langers
Croffe Dagger.	0 -	3 6d. 1 15	Noble.	6
RofeRojall.	01	21	D) 39 1	Lais Sign
Spin Royall.	21	10 d	1000 L	arosus Co
Haf Angell.	10	nd.	led.	arch Gile

Redevilor

All the severall pieces of Gold heretofore mentioned, are set dapen according to their valuation by the Kings Majesties melamation for Gold dated the 23 of November 1611.

A Table of forain Gold-count, according a to their ancient galuation and severall weight of arring in Pence and Graines.

The names & titles	The weight in	The value in
of the Gold.	Pence Grains	Shil Pence.
Phisorn of Scot.	A 2 10	. Je 2 1 0
sutific crapon.	2 5	Half All tyer
Mosts of French	31 2 5	Solven en lite
londers Riders.	2 6	10 8 of 48 80.
bilips Royall.	2 2	128 211 1 8 2 mg
dips Crown	2 5	· 344 1 Pollan
Men Gilden.	11 2 12	2812 10 1910
3	3 K'4	were Ducket.

190	4	
The names & sites	The world	The value in
of the Gold.	Pence Grains	Shil. Fence.
المحسا	COU	UNW
Flanders Noble.	4 1, 10	Halper Jak.
Half Flan. Noble.	2 6	Crope Dagger.
Plan, Angell beft.	3 6	O PONO PONO
Flan.RoyaBarke.	3 10	10 000000
Carolus Gilden.	010 -12	300 161
Flanders Royall	2 6	superingell's
Saron Gilden.	12 2	178 m18 for
Flanders Crowne.	12 5	Addition feveral
Philips Gilden	21	reduced according
Half Phil Gold W	o state with a co	algmentation 6
Golden Lion.	2 16	7
3 parts of golden Lio	0 -0 -0 -1363	The add I he
parts of golden Lion	2 2 2 2	ronne 404 34
Davids Gilden.	2 2	4_
Horne Gilden.	1 12	4
Old undre Gilden.	i agi2 w 14.13	The frame of the
Coufa. long Croffe,	11112 93 1346	5.60 (0.8)
Crufa Short Croffe.	2 6	1602 10 arrowin
Milreyes.	4 20	die The Treesty
Half Milreyes	2 10	80 100
Portague 1 ounce.	2 16	68
Golden Caftite.	2 1 23	6 6
Ducket of Aragon.	, 2 6	- 6 Conumb
Hungary Ducket.	7	
Double Pistales	4 5 9	1000
Single Pistolet.	- 4 d	6 a fine
Ducket of Floren.		13 9
Double Ducket.	4 - 14	6 6
Single Ducket.	1+3	12 8
Donble duc. of Rome	4 13	12.

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for ets, or lara he o or h rula or F

It is to bee understood (gentle Reader) that whereds in these Tables, the weight is called by the name of a penny, it is not meant a penny of silver money, but a penny of Gold-smiths weight, which contained 24 Barley-corns. Concerning which see Trop weight in solio 133

So if a man have not the weight where with to weigh any peece of gold, he may do it with barleycom, being dry, and as it is faid, folio 133.

The prices of Gold which the bringers in of for ain Gold shall receive at the Mint, according to the Kings Majesties Pro-

ol (2 0 May, Anno 1612. 500 31

Toran ounce of French crowns, 3 li, 6 f.

being 22 Karacts fine.

for every ounce of Spanish Pistoets, being 21 Karacts, 3 graines 3 li, 6 f.

or Duckets of Spaine, being 23
tands, 1 graine fine at least 3 li, 8 f. 8 d.

neounce:

or Milreas Crusado long crosse. 3 li, 6 f. 2 d.

middo short crosse, the ounce. 3 li, 6 f. 2 d.

musado short crosse, the ounce. 3 li, 9 f. 2 d.

musado short crosse, the ounce. 3 li, 9 f. 2 d.

musado short crosse, the ounce. 3 li, 9 f. 2 d.

musado short crosse, the ounce. 3 li, 9 f. 2 d.

musado short crosse, the ounce. 3 li, 10 f.

musado short crosse, 1 graine fine at 3 li, 10 f.

musado short crosse, 1 graine fine at 3 li, 10 f.

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Kareets and disgraine fine, at 3 lbs of Lord

And if the faid Barbary Goldbee of loffe for ness, abatement to be made according to the

And being finer; a greater price according to that rate, and being courser; a less, so that bringer in supply the less fine, with the more in such sort, that in the totall it makes gold same rate of 22 Kareths fine.

The price of Silver, which bringers in of forainc Silver shall receive at the Mint, according to the Kings Majesties aforesaid

Proclamation.

For the ounce of Spanish files of the ounce of Mexico mo-

For Ingots of Silver, being and and of the spanner of the Standard of the Stan

And for other Sidver of more fivenesse a better price according to that rate, and for counsen a less for that the bringer in supply the tastesine with the mane sine, in such forth that in this counter, a pence paight fine succending to the Sinishard of Englanded the shall be bounded an equilling

initings ind pounds telfped; but the helpe

del me el e se R E A T' ME (2 via ommos)

The Edward course of 5 of a great of the edward to the crowne of a f. 6 d. a saint the Edward faillings, halfe shilling, and the mathree pence.

Philip and Maries shilling, and halfe shilling.
The Mary groat, and Mary two pence.

Queen Elizabeths shilling, 9 d. 6 d. 4 d? 3 d.

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the

The would I now express the values that support of divers Countries that such the causes I now refraince that and chiefest is, because they are countries and chiefest is, because they are countries and the support of the Realment that they be supported they are the support of the support of

French Coynes.

Flanders Coynes,

rate. And againer they are to different many places, that it were matter enough great though to speake sufficiently of the state of the gether ignorant of them, I will thew po values of fome that are most in use, and rice according to that water, and proposed to

French Coynes.

Souls, and Frankes: To deniers make i ling 20 foulx make I Frank : fo that as feetbele 3 kindes are like in the rafe to pe shillings, and pounds with us; but that is the difference, that their denier is but ninth part of our penny, and to vibete & (commonly called Soules) goe 9 to out ling, and 9 of their frankes to an En pound of money. So that three of thetr for make a noble. And by those three you macife bom to ceaute French money int glish money, according as 3 babe fet forti and Marier Builling, and hat; gridellot

2160) 219 OW Y 240 d, 07 20 fm 3240 Deniers make 360 don 30 f. d. m. 8352 Dong stard briz 5928 d,07 3 dli. 476 2160 foulx make 240 shillings. And other in like rate. As for the rest of Counce 3 omit them till beveafter, th have found under tranbing in broken mum that note as for the Cornesus Plan than bee to changeable, that you must be them from time to fine the gon camil

softhem into our andney certainly i his

Flanders Coynes.

rafe

an example of their me Groats Flemish, Carolus and Guidines he Groat is a little above 3 darkings a fingle fliver is a door qualify far be mouble friver, Carolusta 4 de obre is Eben there is also the Carolus which is most one stivers. And the while is worth 3 Carolus Guidens things into pence, therefore arm tif you would convert Flemish mos Note we red softed denom of only astrone the Coyne, Seforexample of a pace 368 Double Divers into English confidering that a bomble fliver cond, farthing) pour thall first look boto things be in the nonlike liver, and you the Rivers by 33 and then have not me in farthings, indich is 47.84, no oin to that by Athen there will announce of more and potteries more and potteries accompand and then will the qualifying elars Author, touching toppillid adt to am ife if you wonth reduce any fumme divers into English money non an of the famme first by 13) and then have reduced them into a certaine fumme, that

Danks M onev

Spaniff Money.

Reduction. the fair faithings to bed from it wall of the stone ting 964 the furnier will le Grone Heinlin, Creches Do seduce to bying ond! Denomination int nother, if there be any Remainer after Divilion, that intits we have by the dent nution of the growe famous that there bely As for example, I would bring 254 things into pence, therefore I vivise things into pence, therefore I vivise that yearly and the Quotient is 634 with the manne of the pence, and then introductionely a wall are farthings will as one may a Note wel. by blooking. And the mail be indicated in Division, namely, to be the to bond top Re-Ction. the Soulz, whereof to to a Liver with Danks dillings sterling. Deep was also there of whereof 80 make a Gilden, which is a simple sterling. Diep have also Dollors, their common evols Dollors of Graft. Dollors they was, which be bettered from the 24 Graft, four at 26, and follows And thus much a thought goes to have the Author, touching Danks Money. Money Concerning Spanish Money, tobered most common are Cornadoes, Marvel Sobnish Money. Marveide, 4 Marveides main a Hyall, The attil the of the App Ry the could have been been

Risk milie one Ducker, to the Darker con-103 72 Marreider, woten is mout in this A hundred-1519 by milling of South At the Control of Duckets, confluer that pence to the palue or denomination numer in this is pencepano to maketh 2985 supence: to If you divide by pence that & Ducket to (abith 18 70) you that! have for your Quelle per Duthers pour pe fred god ind and preside they to both Bertish Souldyes, Venice Beetes amhe an Guglitt pringsed money. descuit ming inputes at Soludy the sime to lyeva Lieuwerer Venied tobich is Appliant halfe hundred is 56, the quarter 28, normal mucha have I faid of Money up Now Weights. different your mettles formet differentien of weights. Mid Sauch em altranach Int. 40 there Troudow to lorbed our fone of weight : id 84 Barley weight?w Syverph ration out of the middle for of the A ponny and we prany weight, 20 of Wide pours weighted Mi make an others: and 12 bunces a pound of A pour Pearl, Silke, and fuch like Bueborn e there? isoufed another weight willed Haberdin erdupoile ; in inhich so ounce official a poile

life, brand totthe troy weight ded built

d. O Derefore when you would treduce estated points of the wind of the best of weight O weights.

Divide

edicate vilus the are called so hu and a quarterness and halfoquattern, &concaimonab to suled a Scholar. Why o to there may be received on the company of the comp Maller All thefenere numbers of wo but they have not common weights may their rate at the other have. And again, that Addingame, account talk in count they from by their name: 100, an know notiff app; but to a wound. Land, halfehundred is 56, the quarter 28, a halfe quarter, 140 And thele be the con weight afen in moth things that stold Dolobsit there are in some things. names, as in Wooll, 48 pound is not ca quatterne, but a Todde : ant 14 poppe named halfe a quarterne, but a Sconor a 7 pound balte a Scone. Diter named by then differ in many places and spree in a

t

Woolle weights. Todde: Stone וו סניחכר. ban o

A bundred CTE

weight.

Spine V .vanons

Sack of WoolL

Cheele weights.

But a Sack of Wooll by the Statutes mited to be 26 ftone sidul ni : sliogubi

Thoman Cheeles shough it be talo b hundred, and by the floor in famorates, the perp weights of it are Claves, and We for the Claves, and We for the a Clove contained a pound, it

esidio

weight.

wey 32 Cloves, which is 256 pound, that is a feet and 16 pound, and fo much weight the wey of Suffolke Cheefe, and the like is a month be the Barrell of Suffolke butter.

for and fixteen pound : and fo much is allo

the Barrell of Bisex butter.

Moreover this weight is used by the Apothecaries in their Physicall composition, and mixture of medicine, wherein the least is a graine.

Soruples

A Scruple

A Drachm thus

The Dragmes or Dragme cha
B Dragmes An ounce raction

A pound. Tred. The

The Apothecaries weights.

non of weights are made other measure. Measures of log grain and liquor: \$602 a pound in Troy for liquor weight, maketh a punt in measure, so that 8

ound of 8 pints to make a gallon: halfe a Gallon.
allon is named a pottle, and halfe a pottle is pottle.

above a Gallon the next measure is a kin: then the Tertian a Kilderkin, or halfe Ferkin.

me and a Barrel. And he thefe measures are Terrian.

Brammonly Ale, Beere, Wine, and Oyle, Bur-Kilderkin.

Sope, Salmon, Herrings, and Eeles.

of their vellels do differ, for the measures am all are as followeth.

the Firkin contai- 8 Gallons, the Barrell neth 232

Ale-meafure.

Reduction.

Beer mea. Of Beere Sebe Kilderk Scontai- \$18 Gallon fures.

Sope mea- Sope merfures, both Firkin, Kilderkin, and fures. Barrell Could be equal to Ale measure.

Moreover the Statutes doe limit the weight of every of those three vessels being empty.

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Gal

A Barrell to 3267
Half a Barrell weigh 13 pounds.
A Ferhin Sempey 56:

Herrings. Herrings also sold by the same measures the

Herrings are fold by the tale, 120 to b

hundred, ten thousand to the last.

Salmon & Salmon and Eeles have a greater me

Salmon the Butte | 84 | Gal-Salmon the Barrell hold | 42 | Gal-Seles halfe Bar. (eth) 21 | lons. (the Firkin) | 102

powbeit, some Statutes did limit be vellels equal with Herring vellels.

Wine mea finalter then Hogsheads, which are of 63 G lons: Chery Hogshead, is time Barrels: there are many other wine vessels, but them all see this Table; and marke the m sures one by another.

y)	the Rate	let >	(18;	5
A CONTRACTOR	the Ban	ell Jan	1312	A COL
Of wine	the Tert	h. (hold	384	lons.
is facts.	the Pipe	SHE SHE	126	griffight-
Edmis.	the Tuni	10 J	(252	June 9

Bit you shall marke that there be other Tertians.
hinter of Tertians: for there be Tertians,
(that is to sap) Thirds of Pipes, of Hogsheads,
and of Barrels, as well of other things as of
Wine.

A Butte.

And thus much have I thought meet to tell

Scholar, And is that alwayes true ?

Maken I have told you bow it chould be, but how it is, I may not lay: how they doe differ dayly from their just measure, that Gaugiers can tell you better then I. But I will let this passe now, and speak briefly of the other measure.

And as of weights there did spring the liquid Drie meameasures (whereof I spake last) so of the same sures.

pringeth dry measures, as Pecks, Bushels,
Quatters, and such like, whereby are measures.

Corne and like graines, also Sak, Lime,
als, and other like. And this is the order
a quantity of them.

Peck to the measure of tho Gallons,

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Sch

A Bushell. A Quarter. A Wey.

A bufbell foure Pecks. containeth Leight Bushels. Aquarter fix quarters. AWey

These are the common names and men fures, but in divers places there be divers form

Strike. Cornock.

The Bushell in many places is two Bushel but then is that Bushell there called a Strike and in fome places balle a quarter is callo Cornocke. But thefe divertities are too m to tell you briefly them all : and againe, thep are against the law and statutes, 3 c them unmeet to be used.

Meafure to mete length. thickneffe.

But now remaineth pet another kinds meafares, whereby men mete length; bredi and thickneffe, and those are, an Inch, a Fon bredth, and and fuch other: iphole names and quantit this Table theweth.

An Inch. Foot.

3 Graines of Barley in bength mal

12 Inches a Yard. 3 Foot

Yard. Ell. Pearch. 3 Foot and 9 Inches?

Tards and a halfe \ Sa Pearch. I Pearch in breadth, and 40 in length, do

a rodde of Land, which some call a rood, so yard land, some a Farthendele.

2 Farthendels? shalfe an acre of grou 4 Fartbendels

Acre.

More, 40 rods in length do make a furl 8 furlongs make an English mile, which com eth 320 Perches.

So that an English mile, grounded the Statute, is in length 1760 pards, s foot, and 63 360 inches, and all out of friend

Somewhat greater then the Italian mile of

1000 pices, and 5 foot to a pace.

mere might 3 fell pon many things elfe tousbing meafures, and allo boto to reduce france meafures to our meafures, but becanfe it cannot be well done without the knowledge of Fractions, which as pet pour babe not learned, 3 will let them paffetill another time. that Thave taught you the knowledg of broken numbers.

Scholar. But pet fir of the parts of time The parts

I map pou tell me fomewbat.

Mafter. You know that a naturall day bath 24 houres, and every houre bath 60 minutes. A day, It needeth not to tell you, that 7 dayes make An houre. a week, and 4 weeks make a common month, Week.

and 12 months make a year, lacking one day, Yeare. and certain houres and minutes : but of that I wall instruct you bereafter.

Here will I make an end of Reduction for this time which though it be counted no kind several f Arithmetick you fee it is no leffe needfull to be motive; or easier to be done, then any of the o-

Scholar. Marry fir it feemeth unto me much ther then any other fort, for it requireth knowledg of fo many things: but now then you fee time, I am ready to learn as much of Reduction as pon babe of me, I remember; but and if I at any time forget, I thall have recourle

of time.

Reduction.

140 course to the Tables which you set forth fo me.

Mafter. So boe pon : foz it will not bere membred inithout exercise. But in as und as pon understand to much as the babe in treated of, 3 will now instruct you in pogrefion. real section and and an area from

asing the second to the second of

mile being being being verbe A CHARLE ST GARD TO SERVED Hitti, Aband games on Motol

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Progression.

Bort Jeell

L'hough until this day the most part What Proof writers have defined progression greffion is. as a compendious kinde of Addition, yet truly it is not so: for Progress. on (as the very nature of the word doth inform any man) is a going forward and proceeding in numbers, and that regularly and orderly, whose place is aprly chosen to be very neer, or rather next after the exposition of the four princivall parts of Arithmetick; for in it after a most case manner, are all the four former parts exercifed and practifed: and not onely Addition, as customably is done; Which custome bath been the confe why it bath so specially been named a kinde of Addition, and defined to be a quick and briefe addition of divers summes, proceeding by some eminine and reasonable order.

Dou hall also understand, there are infinite hinds of progressions, but for pon(as pet) tim are fufficient to be exercised in, of which the one 3 call Arithmeticall, and the other

Geometricall.

Brithmeticall Progression is a rehearfing or Arithmetiscing down of many numbers, number after cali prother, in such fort, that between every two greftion. unt numbers rehearsed or placed down, the diffrence, diversity, or excesse, be equall and alike.

Scholar.

Scholar. Sir, I thank you to; that you bake both opened unto me what progression is in ly, and also why it is here placed.

But 3 pap pon with an example mail

plaine pour definition.

Master. Examples cannot want, seeing a reasonable creatures naturally use the open of one kinde of Arithmeticall progression (which therefore is also named natural) in soever they distinctly doe count or number multitude by one, saying, 1,2,3,4,5,6, who by the proceeding from number to number, every one surmounting and exceeding his stown mert before by a like quantity (which is 1) declareth the same to be Arithmetical progression. And sor the more platinuesses, it down in this manner.

The common excesse.

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The Progression.

Scholar. This is most evident. And 3 the that 3 am able to tell you now of any program from Arithmeticall propounded, what is the common excesse or difference inhereby it me

teebeth, if this order be kept in it.

Master. What say you of 3,6 9,12,15?
Scholar. They erceed each other by 3: A that may I set down in such evident order, you did your example of naturall progression this wise.

The sommon excess.

The Progression.

tn

Master. And doe you not also not persecte that the tubole Table of Multiplication map be made by the order of progression Arichmeticall e either it you will begin at the first number of any of them on the left hand, and to proceed right overthinart : or at any of mint numbers of the upper row, and goe ofrede downward.

Scholar. I pray you let me consider the thinga little, and I will answer pou-

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# frial	1 3	2000	1-1201	27

this triall I perceive it now very well, the common excess or difference bes many tipo nert, is continually as much e first number of every rain, either from left hand obertwhart taken, or from any

of the uppermost overthwart rowes down

To know t e totall fumme of an Arithmeticall Progr ffion. Maker. Rain then, it of any such progression, you would speedly know the totall surmuch quicklyer then by common Rules of Addition: Art tell bow many numbers then are, (which numbers here we call places, or parcels) and it they be opde, surite the summe nowne by it selfe; as in this example 2,4,6,8,10,12,14, where the numbers are; as you may see: therefore set have 7 is place alone, then adde together the first number and the last as in this example: Adde 14, and that maketh 16, take halfe of it, a multiply by the 7 which you noted to; in number of the same places, and the summe that amounteth, is the summe of all these gures and the together: As in this example, summer of all those squres.

Scholar. That will I worke by anothe example. I would know bow which is summe is, 5,8,11,14,17,20,23,26,129. I the places and there are 9, that I note. I put the first number 5, and the last 29 to ther, and they make 34, I take the base of that is 17, and multiply by 9, and it make 153. That you say is the summe of at the make 153. That you say is the summe of at the make 153.

printed by all both and ber mot for

Maker, So that you find it if you try it such that all Maker. By your rommon Addition.

if you appe all the parcels together, you thall fee the fame fumme amount, if you oil tombe well. And that manner of Addition tryeth all kinds of fumming any Progression;

Mafter. Then can I fumme any progreffion, ff the number of the parcels be oute. But inhat if thep be eben : as in this example.

1,2,3,4,5,6,7,87

Mafter. Wilben the number of the parcels is spen, then note that also as you did before, and like this above the first summe to the last. elfe of the number of the places, e you multiply if: as in our example, the partels are 4. that I mote : then abbing the hat fumme to the laft, there amounteth o, that by 4 and it maketh 36; which is the furume of the parcels and 191 and

But if you will take one Rule for these both. be thus : spultiply the half of the one by the ther whole, and the fumme will smount all Hos fometime it chanceth that the num. A generall berof the parcels be obbe, fo their baile canmthe taken : and that fometime it chanceth the Addition of the first number and the tast, bing forth an obje number, is that haife It cannot be taken a but they will never be The excesse being given, and the for 3000 dl

Scholar. Then I perceibe this, if there be place is given from the . B of pringroled scom

dafter As accustonable it bath beene ight, this bath been the chiefs and onela erercife

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may perceive how offers wayes, and to be great profit to simple a thing (as this Ann merical! Progression is) may be considered and also, I will here propound you six propositions: of which tours of them were intented by a triend of mine and never before the published: and the two sirst were never tow knowledge to titen of but by three Men.

Scholar. This both greatly encounted to be attentive unto your thomas feeing thall not onely be instructed at your hands the common knowne Rules of this emilent Art, but besides that, so abundantly other new rules enformed, as my very a trance thall seem to passed great many mouther study and longer continuances to fore Sir, I beseech you, let me know you propositions.

Mafter. Thefe then are.

To know the last number without proceeding continual Addition, till you come unto it, so the the common excess se knowne.

The first number of the Progression and last being knowne with the common excess:

finde the number of the places. In an homen !

3.

The excesse being given, and the first or last know the insuntity of any middle number, who place is given from the first or last and stone

The rical farmer being given and the first a taster finds wer the number of the places. 1000

The totall sum of any Arithmeticall Progression being given, and the first and last, to finde out the common excesse.

The totall summe being given, and the mutuall excesse, with the number of the places, to give the suffer or last number of the same Progression.

Many moe confiderations could I propound you in these Arithmetical Progressions, but these are sufficient, to give you occasion to think that Rules of knowledge and Arts are infinitely capable of inlargement.

Scholar. Happy were I, if I did but well morestand that which is already invented and written: and yet in my simple fantasie, these things offer themselves (in manner) to be sindied for about Progression, therefore I purpose proceed to the Rules answering to these Propositions.

Maker. I will orderly for every of these six propositions give you Rules, and with every one and example, unless the plainnesse and example, unless the plainnesse and example need no farther exemplifying,

For the Solution of the first multiply the excesse by anumber lesse by I then the number of the places, and the off-come adde to the first number, so you shall have the last number, which is sought for.

As for example. Bethere were seven places a Progression Arithmeticall, whose considerable encrease or mutuall excess were 4, and the first number were 5, and I would be what the last and seventh number is: multiply 6 which is one less then 7, (the number

number of the places) by 4, thereof commerce, which I about o 5, that maketh 29, we that is the last number which I desire know. And this you may Araightway purby continuall proceeding from 5, till a sevench place, encreasing every one by 4, a thus.

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5 9 13 17 21 25 29

Lohere, the last, being also the sevent

Scholar. I perceive already one good process in this Rule, which in all works in be believed that is, it will ease one from an labour, it a Progression were propounded a bundred or two bundred places or mose the also it is very east to work, and most not fary sor the rotall summe sinding, in a most ong Progression.

Mafter. It is true, and therefore noise me fee it you can answer me this question

this proposition.

A Merchant buyeth 50 pounds of Spices, agreeth to pay for the first pound 4 pence, the fecond 7 pence, for the third 10 pence, the fourth 13 pence &c.

The question is, both much bee must see the last pound, and then bow much the

pound commeth toe

Scholar. According to the proposition, multiply 49 (which is less by one then number of the places) by the excesse, which

to the Browne 1476 & appe the first number which is 4, it maketh 151 pence, the price of the last pound. Roly I appe 4, the price of the first pound, to 151 the price of the last pound, it maketh 155, subject I multiply by halfe the number of the places, which is 25 the product, 3875 pence is the total funerue or price of the 50 pagnes of Spices, as appeareth.

40 Places 1 leffe, 1 \$1 last

3 excesse

4 first

4 first

25 halfe places

370

Malier. It is truly to cought.

Scholar. Then I entreat you to proceed to

maintain proposition.

Milet The freed Rule is this From the 2 Proposition.

Milet The freed Rule is this From the 2 Proposition.

If should the first, the temainder divide by the tion.

common excepte, to the Quotient adde 1 and you see the number of the places, which you would up As in this Progression.

6 11 16 21 26 31:

on,

feb

If I know onely 6 and 3 1, and that they encroate

encrease by 5, then according to the rule, from 31 I subtract 6, there remainesty 25 which 25 I white by 5, (the common excess) to Quotient commeth south 5, to which I am 1 that maketh 6 and so many are the place as poulee.

Scholar. This Rule is to ente, that 3 be much to blame, it 3 comb not remember it.

3 Propoli-

Master. The third Proposition may always thus be solved. Multiply the excesse by a number lesse by one, then the distance of the place is for the first or the last number given; the off-to adde to the first, if the distance be reckoned for the first, and the first also knowne, or subtract for the last, if the distance be from the last counts and the last given also, and that which common forth, either in that Addition to the first, or su traction from the last, is the number sought of or example; I propound you this progression.

8 15 22 29 36 43 50 57

And for the apt confidering the manniths question, I will note over every place distance from the first, and under every place distance inclusively from the last, thus.

1 2 3 4 5 6 7 8 8 15 22 29 36 43 50 57 8 7 6 5 4 3 12 1

Pow if the excelle whereby this progle

lifte

for winders, be undown to be 79 and the ill nambers given, being 8; 3 would hindre he fourth place. I multiply by 3(white coned) that peoldern so, to which I abbe o felt mimber fortometh 29 1 toblet to belong to the fourth place, as you used eximple it into vother it in the child place among the child place among the facilities and a subject the children among the face the children among the face the children among the face. meters to be 1719 and the common operation of the series and the hid property sold in the series of the s Monto perceive fight good und Drivil water the set the distribution of the and water re and remember and but the gharms might is tonie by the knowledge of the

Macher, Collecter if be sentagil padein in the Chine of the Collect of the Collec

numbers

4 Propose

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4 Propoli-

Malier. The male of the founding and another of the complete and the place of the complete and the place of the complete and the fall grands and the last 57. If I along 17 and 18 found the complete and the last 57. If I along 17 and 18 found the complete and the compl

nome thinkers, that it vistered high ness nome appropriate that it is a special that the special that the special that it is a special to the special that the special that the special that the special that the special the special the special the special that the special the special that the special the special that the special

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Male a A musti much berein conument your mutuelle both in memory and in trelle au olying pour rule: although in manifell words Mafter. The arethmetern on enighnes, of Scholar-Site. I page you beare mee fusing chample, more than the the scom slemmen Maker. I are theil pleased, so that you bee hat for you make me more longer here there dingly A would bave been a but I council well-both I could bave arrifted any thing the west pour great lack thereof. with dicheleration & had received 85 pounds of A question certain men but of how many I bave forepay of money. on you keep embershap the first gave mee 7 and the lab 27 pound, and every payat after other did mile by a like furnise indiherman for whom forceived this money. additioned with meet has of every payment about have swelve pence for my Jahans maleffed can by Ast finds the truch of is cafe, I am like to la fe the most part of my award. or named of danger seeman ful dies Mafter. I perceibe you can bandlamely nan example, which thould concern your gaine: 3 pray you let me fee boto reau bo justice in this point a senso out of

the left together, that mis- 27 17

34 by which I divide 85(2

lube Et the Ash, & the refidere divide: aude

The both note ? Sir, bere in ind affal and

commant of 17, in subjeb 34 cannot bee

noint

han: to that now I am luthe bylers to bis aling of my quotient, and farewell then bo Malter. De are never the farther from h

Marabona to fall into a fraction : Form hall understand, that the fraction which any fach worke proceedeth, is ever half of ach as the unites of the quotient before And that you may try, if you boullethat w to commineth for then it will be equall to p divisor, as the bouble 17, (the remnant) maketh 34, and your Divisor also was 341 noteth the remainder to be halfe of one.

Scholar. pow 3 am glab of this barb. ambles for with it I have a generall rate the fraction that may bap in this work that the quotient being two anda half popple that, it maketh 5, therefore Gould and to be Tafillings. And to be thre (by leaver's will tro th, for 3 will mattery of 34:2 (which is the fift : All ma ! , Sie 17 . 510 and laft number jopned to wether bois, thus, non allowing Establish 3t 46 mott true (3 fee) Telques na sa

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that I thould leefe nothing & 1851and by the former working.

Malter. The fift proposition hath this vall pertaining unto it . By the fourth tute find number of the places that being done, fro the Subtratt the first, & the residue divide by a ber leffe by I, the the number of the places, quotient will form the excefs which is fought

Propo ition

In An example hereof shall be this: If yo had Example, additional to a certaine number of men, you neither can tell how many they were, at how much the lones money exceeded his next before, but you are fure that the excess misequall betweene every two next; and also you temember that the first had 19 and the last 180 pounds, how would you finde the number of the name and the excess, continually observed in the succession of their payments?

Scholar. Pour rule Doth platnely bio, firft

to finde the number of the planty and and

tes, which I will do according to 118 or that

mb in 8 together; thus. 188 . 99 Allen

to Ep tots 1375 3 Divide 685 1137 Gidel

Seeing there is no fraction and all aligned but a two le number, being 685(520019, J touble that, and other 227, 1112, and the number of the plantal and the combined of the plantal and the combined of the plantal and the first assence that the first assence the fi

Morning the man of dank : and; 811, mon from his equal is now. By the 1:00 distinct

This 99 I divide by a number lette by one in the number of the places, and feeing the less were 10, I divide 99 by day and less with the places, which is the places.

excels, if I have followed and The strain wind the strain of the last number of the last number of the state of the strains of the state of the stat

99 3

Master.

y trace greete teleporous staileness respectively exemple a glant one reore mis them check another eight acceptant one reore mis allowed another eight.

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making, to that the number of the places, to execute, and the vocali fumme may trafgite interes as your full example troop, and the

The common exceffe.
The progression.

and pounds, the state of the control of the mander of the control of the control

That the places bee 10, and that from a first to the last, which common excelle is 14, perceive most excently i but inhether the tall summe bee 685, I have not get promished I will now book I append and it together, that maketh 137: I multiply by halfe the number of the band and append of the places, thus.

All things naite amount of eligible states, so that-Hand per sounds out the feet enough in these rates, with the transfer of the first and it is a state of the s

Mafter. Wie makethall things perfed!

6 Proposi-

Tour fixtherule is this. By the number of plus and divide the total famine, double the quest, and that will be the first and last joyall one summe. Then by a number tesse by the the number of the places, multiply the extendation of the first double that off-come subtracts specifically in the number, and the halfa of the residue is the number. The last number you may diversity number. The last number you may diversity.

our, as by the first of but fixe rules, wiby fab tracting this first number from the fumine which the contained both the first what last gog hely (or thirdly) by continued what he the ofe in him?

Scholari I pray you make this fometobat more plaine with an example. at Just works

Matter If every moneth in the year counting them now as 13.) you galifeld clearly 40 of gaine, many more then you did the moneth next going before, and at the years endy ou find the who higaine 97 20 Hillings, but yee lendember not how much either the gaine of the first month of the laft was, by this rule it may bee frag 200 from 880. tried out.

a Scholar. So that beed be feeme to apply the symptoched to shifteene places the first before lings every one more then the other tien before it, to be the common excesse, and 5720 shillings tatte cocall famme. oce 240 280

Milter. Wis trae by 13 than I divide 5720 in this

thanke pour molt bearthmen Scholar woodle the quotient indulte ger and learning appropries Geometricall. comercicall. congot smmud flat school

propolitions which min appropriate and of al call Progression.

And for the and madife of them. I w propone unto pour certaine pleasunt and net Questions Arichmeticall Prografit and to the performance of their working fact

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Example

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know : that is 200, mers my office sminly 3486 And as to the last number, 3 can give pan it three wapes. As by the first of fix rules I multiply the excelle by a number of the places as of gaine. by 12 that giveth 480, which I appe to the fie being 200 to that the late be 680 worl

The fame fumme commeth forth if geef trad 200 from 880. and thirdly, 313 begin at 200, and lon

seed encrealing by 4913 wall at the chirten place babe-680 as thus scom and grove a lobe the common excellently \$720 fail 320 360 490 8 240 280 200

480 520 16 ter. 040is trapolio 000 eidl mosts solvid El

Scholar I thanke you most heartily these sine sules. Poin that beapour pleated thould bear and learn something of Progress the laft fimine topies Geometricall.

Malter. There are petibery may mick propolitions which fall into this Arichm

call Progression.

And too the nie and practile of them, 3! propone unto pou certaine pleafant and not fare Questions of Arithmeticall Progression and to the performance of their working

fach necollary rules and documents, as are reguille to: the better understanding of them, 02 fachitke of al tadt (the nosut almalan

Acercaine Mercer fold to pards of Velvet to Aquestion besaid in 12 we kes by Arishmeticall proportion: of Velvet. the ferend weeke 12 foillings, the rhied weeke 18, and a forth increasing the number of weekes by 6 hillings, till the twelfth and last week were expired. The question to boto many

pounds be had for 20 yards of vel-18: estat frome of 22 pount & College all

Sothe performance of this que- 24 flion and fuch other the like, I fet 30 some example, here appearethed nothing 42

The touching the adding toge 150102 (1.48 farof these summes, without the

of Addition, according to the 3 taught you in Progression 66

Arichmeticall, 3 note the num . 3111 72 of the places, which are 12, then adding of number of the progression, which is the first number together, make 78;

maltiplying 78 by balle the number of the montes is 6, amounteth to 468 faillings, mos maketh 13 pounds & thillings. formuch hath the Mercer for his 20 yards elver subtet is night about 23 shillings 5

ode, the second 12 shilling me chaland moerstand this worke very but is there any proofe for the julifying Collin bereof

Dereof, as you have of other monke and the Maffero The worke of it felfe (being perfectly wrought) that in your process mo going torteard from number to sumb each number erceeving his fellow by an en or like quantity, is all that is demanded justifying of the same tyet notivithicanti because pour request is reasonable, I will pone an example for the proofe bereof will d Theath Longs hold with

The proof cithe laft queltion.

cauranch.

A certain man is bound to pay fon 20 yan Velvet, the summe of 23 pound 8 shillings, a is to be paid weekly, in the weeks or sein Arithmeticall prograffion: Whe quellin therefore to know with inhat number the Progression is to be begun and continu fuch equall proportion Arithmetically 1 # 2 weeks the facie thap justly be note and of mildrona englished to

For the refolution tobereof, and of all other like, reduce 13 pound 8 shillings, all thillings, which maketh 468, thillings it to

A generall rule.

Then sobe i unto 12, the number of termes is maketh 13, which 13 postiball tiple by half the number of the remise; white 6, it maketh 78; then office 468 by 78, you that finds 6 in the quotient contichts true number that that! begin ambicontion faib Progression, What is to impite first 6 shillings, the second 12 shillings, and third weeke & Chillings more, Robtch & thillings, and to every weeks as they's hilling odmun 23490

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fillings more then the weeke before, as to nifell the the queltion afterelaib. 1 (o) : neit on A Farme is to be fold to be paid by the weeker A question to a weather the finst meet to pay a shillings, the fa- of a Farm. and oforth, incheafing each wamber by a till the under of giz (which are the humber of week! in a pente expired by The question is, what the price of the Farme commeth ter

Scholar & Doubt not but, by that you have already taught me, to end this question bury will biteretore I det fath the Progression Musch to blante, if Rendt's Respecte of

faller pap stay a tobile : And here for farther ease, (to abringe you of great that appeareth forall out in this que tion, and to may doe in any other the like it a inflion were proponed of a 00 of 200 places can bee ended unlette you know abde what the last mamber of the Progressie albo 52 place to, (at ought to bee) 3 will on a generall rule bow to know the last the it got this ordinally prodectes by con-

fantake, offer themletves that es geneine hiply the excelle by a minbertlelleby A generall then the minter of the plates, and the rete rule. the first number of the Progression, and Matt bave vohr dellrepmitoulinos wiest Pialedia 208, A adde fherennie fhe fi

numbe

Addition; of you had some to the hine

noi Suno A

scholars. Whise rule is small worth the sting: for it. I understand you aright, I con not that my excelle is 4, which I multiple it which is one less then the number the places, and it maketh 204, whereund about the first number of the Progression which is 4, and then it is 208, which you is, or would been the last number of the gression, we distance of man 4 of 100 m.

there were never to many places and the

much too blame, if I do not remember it. I have fuch an eafer light into this excellent Are, that my first tranca both seems to passe a great many further study, and longer continuance.

Master. Many moe considerations could propound you in these Arithmetical Propount; but these are sufficient for a talte, to you occasion to thinke that Rules of knowledge and Ares are infinite capable of enlarment.

Scholar. Happy were I, if I die but understand that inhich is already into and written. But these things, in my la fantasse, offer themselves to bee greatly had sold unto the sid of Progression: A feight unto the sid of Progression: A foremond in the sid to and and the side of the sold and the side of the side of the sold and the side of the side o

placed is 208, A adde thereunto the

num

imber of the progression, inhich is 4, it mas of the places, which is 20, and it amounts to 5512 thillings. And to much is the to-lumme of Addition of this progression. maketo 275 pounds 12 millings, as aptets bere by my Tables.

ofter, I like well your tabour, and com-no you to, your viligence: I will vers note one example more, and therewithall on time will end progrellion Arithme-

certaine man bought 20 Ells of Holland, to A question ad in 17 weekes, or termes, by Progression of Holland butticall: and the first week to pay 1 shill 8 pence, the second week 3 Millings 4 pence pence, and fo forth, each week succeeding the more then the week before. I be gued on is, what the famme of his 20 Cits comments.

Scholar. Becanfe bere is mention made of fhillings and pence. 3 feare there is barber matter tontained berein, then in ther before; therefore I pray you worke felfe, and 3 will offigently mark your noishow A

ifter. There is no moze to be done in this. in the other before : but because your ree is fo reasonable, be attentive unto me. ? Fire, by the generall rules, where to find the last number of the 17 place, what this

roop le

this Brogressian aught to be. Therefore he in my Tables multiplicing the excelle 20 by a topich is one left then the number of the curious places, and it comment to be 320; it because adding the first number of the pagestion, which is 20 pence, all is 340 per 07 18 shillings 4 pence: to 2 sa much ought task number of the pagenesits to be.

Then boardy, to know inhat the mhole places amount unto. I and the first num of the Progression and the last together, we make 360. Now because 17 is an ovoe her, whose halfe cannot be taken. I take halfe of 360, which is 180, and multiply 180 by 17 commeth to 3060 pence. We maketh as you see by Division 12 pound inclings. And fo much is the buyer to adopt to you divide by 20, the number of Esles, was beight, you that find 12 inclings 200 and so much payed be for an Cite one was nother.

The Proofe and and and

A question

A certaine man doth one of pened in lings, to be paid in 27 weeks or terms by di metical progression. The question is to know what number he shall begin and continue the gression, in such again proportion, as the may be truly paid and satisfyed in 17 weeks Mafier. I nord open selabt fo well berei in, tobico to an Arowink and cult certerity to all forte of ment, of lubaf Degree of profesion lief a reduce to pounds to thillings all pence, lubich as you fee bere in many Tamake 3060 pence, that 3 let fand by a in this part of Arichmeticall progression polarmes) indich makethus, which a collemnation by balte the namber of the perme inhirbis 8 inhich 8 in multiope 48 equal melt pe bouck an selection e sousinted with fractions prober broken numbers, therefore pornthall let that paste and htiply 17 by the halfe of 18, which is 9, (for but is all one with the multiplication of 85 mamultiplication of o into 17 matteth an to les 153. with tohich number you chall its the 3060 peace beforesaid, and the gad-at bringeth forth 20 peace, subich is the number of payment to beginthe progressiwithall; and fo each weeke furceoing to pence mare then the wacke hofore, and oby in 17 weeks thall 12 ponno 15 dil n be paped: as before was fufficiently be-The Thus much for progression Acithry mumber containeth the other (thelia bolas, Certainely Sir, I know not bein ander you condigue thanks for their bens flamed me, iphich me thinling the are foreast) abfall, and plastant, that Isquart mustels this: Couldes Sungang and in a said Mafter.

Progression on Geomenicall.

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Master, I am glad you belight so well be in, which is an Art of wonderfull deterity all sorts of men, of what degree or profession been they be. And now will I proceed progression Geometricall, wherein I was more brief, both because I have been to be in this part of Arithmeticall progression, also so, that it would require the knowled of Roots and surd numbers, (whereof per learned nothing) if I should frame the upropositions in them as I have done for the Eberefore I will onely teach you two pills see about it, and so end the consciputions works of these progressions.

Progression Geo-

Here is the first example you see, that it re number containeth the other (that go nert before him) two times: and in the secon example three times, and in the third example three times, and in the third example times. Sow it you will know how since easily the summe of any such numbers they has: Consider by what numbers they multiply

multiplied, whether by 2, 3, 4,5,02 amp other, To find and by the fame number multiply the last the totall fumme in the Progression.

Scholar. I prap you morke it by this et any Geoimple: 2, 8, 32, 128, 512, 2048, which I have Progreffied by proceeding from 2, and continuall on.

multiple by 4.

Matter. Aben mit 3 multiply the laft fumme (which is 2048) by 4 also, and it will be 8 1 9 2, Pato mult I abate from this fum the felf number of the Progression, which bere to 2, then retteth 8 1 90 : which fumme I must divide by I lesse then was the number that I multiplyed by. Seeing then I multiplied by 4, 3 must divide by 3, so divis bing 8190 by 3, the Quotient will be 2730, which is the fumme of all the Progression. And new to prove whether you can boe the me, I give you these numbers to adde by tie tule 3, 15, 75, 375, 1875, 9375,

Scholar. I cannot well tell by what num-

erthis Progression both increase.

Mafter. In any fuch boubt boe thus : Die bethe fecond number by the first, and the potient will thew you the number that ettbuth the Progression.

Scholar. Then is that number in this ex-

e s.fo; fo many times to i in 15.

stalter. Do is it. New worke as I fanghf. cholar. The last number is 45875, which ultiply by 5, and it pecideth 323475, from

inhich I abate the last number of the Progret fion, that is 3, and there refleth 2 3'417 obice 3 ofvice by 4, for that is one left in the quotient is 5 8 5 9 3, which is note summe of the progression.

Matter. 31 pon remember well this, have tearned the Art of progression b Arithmeticall, and also Geometricall, to you may probe either by fabtracing of number alone from the famme, and fo there nothing remaine : or elfe by adding gether of all the parcels, for so will the fumme amount,

A quelion of Satten.

A Mercer hath 12 yards of Satten which valueth at 16 shillings the yard, and selleib Same 12 yards to another man to be paid as loweth: That is to wit, for the first yard to one Shilling for the second yard two shillings the third yard foure shillings, for the fourth 8 hillings, coc. doubling each number follo till the twelfth and last yard. The question who bath made the better bargaine of the er vy the feller.

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First you may let boton 12, the num the yards, as you fee bere in this example against each number the number of the due to be pato as the order of Duplacio Multiplication by two feacheth.

Then reloging to the abding up of ming of this progression, where I conflo the increase of this sum proceeded by the siplication of 2, therefore after I babe d

Is energione if	11 Tan 1	Then har for
es di billi de la la		TO SECURE A SECURE AND A SECURE ASSESSMENT
night in -	to - id.	Int which
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יונים חלו: משלום	4	3 1 61 :60
of the names	8	4
ship sur Chies	16	calco vou, tales
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Undem il	128	* 4 10 10 10 10 10 10 10 10 10 10 10 10 10
and their	256	9
tion order from	512	10
10 To To	1024	ALBOB CER
office dules as the	2048	12
diction by	4995	Dupintion C
		call sie van Kam

a line under the 12. I work and multiply the liftiumme by 2 also and it peelbeth 4095: from where I abate the first number of the Propertion, which is 1, and then resteth 4095: which I should pivine by one less then I did multiply by, but seeing it is 1, I need not to ither it: so, 1, (as I have said before) both selfer multiply nor divine, therefore I take his summe 4095 sor the whole summe of the billings, which by Reduction amounted to 04 pounds 15 shillings, and so much bath the lercer sor his twelve yards of Satren: which 17 pound, 1 shilling, 3 pence a pard. But with you will buy none so beare.

Scholar, Po Sir, by the grace of God this

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that to that to dwhen

A question Master. Then what say you to this question? If of in horse I fold unto you an horse having 4 shoes, and in every shoe 6 nayles, with this condition; that you shall pay for the first nayle one ob: for the second nayle two ob: for the third nayle foure ob: and so forth, doubling untill the end of all the nayle, Row I aske you, bow much would the put

Scholar. First, to know the number of the nayles, I must multiply 6 by 4. and it makes 24. Then will I doe that: I will write humber of the nayles every one in order for 1 to 24, and against each number of the nayles the summer of the nayles the summer of halfe pence duly, as the order of Duplation or Multiplication by teacheth, and as in the next figure following

appeareth.

Then doe I resort to the Rule of summany the Progression, where I consider that increase of this summe proceedeth by Multiplication of 2, as the last example. And therefore multiplying the summe by 2 also, and it yeeldeth 1677711 from which I abate the first number is 1, and then resteth 1677711 which I should divide by one lesse the

ryomed, 1 knilling, 3° serke 2° good. Lon lik soog ard bakerste a bedre.

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intal Regis	ı din multipl	p: but feeting	4.00
102	2 that it is 1,	I need not to	
4	3 divide it,	fold (as pon	
4 8 Whe for mos	4 have before	faid) doth net-	
16	5 ther multip	oly not divide,	
	6 therefore 3	doe take the	- , ,
	7 number 16	777215 for	
128	8 the whole i	fumme of the	- 1 , -
256	9 halfe pence	which by Redu-	
S12	10 Aion I find	to be 60 90 se	
1024	II thillings an	0 7 pence halfe	
2048	12 penie : tha	16, 34953	
1024 2048 4096 8192 16384 32768	13 pounds , ro	hillings , 7	
8192	14 pence, ob.	nd manth whom	
16384	15 Mafter. Tha	f is well done,	
32768	16 bat 3 think !	on will bup no	
65536	17 horse of the p	rice.	
131072	18 Scholar. 120 1	ür, if I be wise.	
1 162 144	19 Malter. WHI	ill then, an-	
124288	20 lwer mee to	this questi-	
1040)/0	21 On.	T pids on your	
2097152	22 A Lord	delivered to a	
4194304		ertaine number A	
8388608		cke, whereof he of	Bricks.
19777216	willed him to	make twelve	
far alerini e	walles, of suc	h fort, that	
	ould receive two	thirdels of the	
tale number,	and the second two	thirdels of that	
nich was left	;and so every othe	r, two thirdels	
that that ren	nained: and so did to	he Bricklayer:	
when the 12	walls were made	sthere remain-	
hone load of i	Bricke.		
ARROW TO THE PARTY OF THE PARTY	Δ.	Dain	

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pow I aske you, bow many load were to such wall, and how many load was in the whole

Scholar. With Stt, if to imposible for me

Master. Ray, it is very easie, it you man it well. Hark toell that I said, that em wall should receive two thirdels of the sume that was lett. Point take away two thirds from any summe, and you must needs gut that that which remainedly, is one thirdels the summe last before. Example of 9, su which it you take two thirdels, there will main three, which is one thirdels, and the fosse from three bate two thirdels, and the will remaine 1.

Scholar. This is true, and now I permitte leaft wall have but two load of brick.

Master. And by the tame teason may know both many load every wall had, a bing as this figure following both them. likewise what the whole summe of but was, for it you make 12 summes, multiple by 3, It ill from the last remainer, as you see here on the left side of the Table, then appeare all the Remainers of the whole wand it you multiply the last of the summes by 2 also, then will that be the su of the loads which was delivered to the Bilayer.

of propor-

10grenion,		
oluzio, ola	12	The Crotage
The Remainer of - 3	II	6 Loads due to
ter every walt. 9	.0	18 each wall.
5071147	9-	5413
81	8	162
butto 10 sensial 243	7	486
129	6	1458
	5	4374
4.84	4	13123
19883	3	39366
59049	2	118098
177147	. 1	354294

of Summe of the loads 5 3 14 40 delive- load all

Agains, if you double every Remainer, as you may fee at the right side of this Table, these numbers will them the summe of loads that went to each wall, whereby you may persuit that each wall was three times so great as se nert less.

notholan Lo noto it appeareth easte enough.

Sob furely A fee that Arithmetick is a right

ancilent arts no located at 18 days another pro-

Maker. You will say so token you know more of the use of it: Far this is nothing in apparison to other points; that may bee much by it.

Scholar. Then I beleech you cense not intruct mee further in this wonverfull com-

JP 4

The

The Golden Rule, or Rule of Proportion direct, called the Rule of Three.

The Rule of proportion.



forder of the Science (as Ma have taught it) there shall follow next the extraction of Rootes of number, which a cause it is somewhat hard be

you yet, I will let it passe for a while, and need you the seat of the Rule of Proportion which for his excellency is called the Golden like the season of the numbers knowned find out any other unknowne; which you like to know, as thus.

The Golden Rule.

Quedion of board-ing.

If you pay for your board for three mount fixteen shillings, how much shall you pay eight moneths?

To know this and all such like question from that consider which two of your abers be of one denomination, and set the two the one over the other, so that the most be it that the question is of: as in question, 3 and 8, be both of one denominon, so they both be moneths: and because the number that the question is asked of, a set the one over the other, and 8 undermost thus, and a supermost thu

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heother number which is 16. against 3 at the right fibe of the line, thus: my sas blioch non

And now to know my question, this must 3 Nose. no. I must multiply the lowermost on the left fire, by that on the right fibe, and the fum that ounteth 3 must divise by the highest on the left five:03 in plainer words, thus, 3 thall multiply the number of which the question is seked (which is called the third number) the number of another denomination, (which is called the fecond) and the fum that amounteth must 3 ofbide by the summe of Itte denomination (which is called the fielt.) The third' Then for the knowledg of this question, 3 number. multiply 1 into 16, and there amounteth 128, The fewhich I divide by 3,4 it peelbeth 42 thillings ber. and 2 Willings remaineth, which I turn into The first pence, and they be 24 pence, of tubich third number. ert is 8 pence, to the third part of 128 thilngs, is 42 Chillings,

ence, which fam Imite at the right mofthe figure a-

16 shillings 42 shil. 8 pence.

the 8 thus.

creby I know that if three moneths boargood came to 16 thillings, that 8 moneths arding will come to 42 Millings,8 pence, wife of any other like question.

But here must you mark, that the first mber and the third be of one denomination, dallo the second and the fourth, for which

pou feek : 02 elle be of fach denomination that you in working may bring them into one as if a man should ask me this question.

Queftion

Twelve weekes journeying coft me 14 French of expence. crowns at 6 shillings the peece, how many pound is that in one year ? Dece you fee no two num bers of one denomination, but pet in worth pou may turn them into like denomination as thus, turn the one year into 52 weeks and the fourth fomme will bee Fren Crowns, by the order of the working. to know this question, multiply the th fumme 52, by the second 14, and the fum will be 728: that bibide by your first ! ber 12, and the quotient will bee Crownes and 8 Crownes remaining: if you turne into Willings, they wit be 48. lings, which if you divide by your first ber 12,the quotient will be 4, which fignif 4 thillings : put those 60 French Crow which make 18 pounds with the 4 thill for the fumme that answers eth to the question, and it is the just expences of a yeare : And the worke 604

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A generall rule.

will be thus. And take this evermore for a generall rule ching this whole art, That the doubtfull or known number that you would be refolved of alwais be fet in the third place. Note also the number the third, must ever be of one natur denomination, or elfe must in working be bron

to like denomination, and then of necessity must

the other number be in the second place.

Remember also that the place of the first number is highest on the left side, and the place of the second, right against it on the right side; the place of the third number is under the first, as by those examples you have seen.

Scholar. This I truft I can boe.

Maller. But and if the question be asked that: In 8. weeks I spend 40 shillings, how long will 105 shillings serve med Here you see that 8 weeks answers himself, and satth 40 shillings.

but how long time 105 thillings wil ferbe you know not. Therefore you thall let 105 in the third place, according as I told you even now. And the first place must alwaies be of the same nature or Denomination that the third is of, which here is 40. Then must 8 needs be that other: Pow multiply 105 by 1, and it will be 840, which if you divide by 40, I will peeld 21, which is the fourth number, and themeth how many weekes 105 this lings will serve, if you spend 40 thillings in 8 weeks.

the figure of this quellio is this : as if you would tay: If 40 shillings lave for 8 weeks, 105 weeks.

Shillings. Weekes.

Differ of derlities there be of working by his rule, but I had tather that you would tarne this one well, then at the beginning Note.

to trouble your minde with many formes a morking, fith this way can be as much as all the other, and bereafter you thall learn the

ther, more combeniently.

And for your further aide and instruction to make you better acquainted with the Golden rule, I have here proponed fix que ftions, and their answers, which I think mol convenient and meet to prefer the delim to perfect understanding. The first foure in all branches of one question sprung out of the belt tree (for a young learner to talte of) that groweth in this Ground of Arts : for that m manner of question in the Rule of Three whatfoever it be, can be proponed, but it mil be comprehended under the reason or stiled one of these four.

The Questions:

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If 15 Els of cloth cost 7 pounds 10 shilling what comes 27 Ells to at that rate ? Answer, pounds 10 shillings.

If 27 Elles cost 13 pound to shillings, wha are 15 Els worth? answer 7 pound 10 shilling

If 27 Elles coft 13 pound 10 shillings : hi many Ells Shall I have for 7 pounds 10 ft lings ? Answer, 15 Elles.

If I fell 15 Els for 7 pound 10 shillings; bo many Elles are to be delivered for 12 pounds 16

fhillings ? Answer, 27 Ells.

If 8 pound of any thing cost 16 millings pena pounds Answer: 5 pound, I shilling odis

If 4 pound of any thing cost 7 pence: what money mill 8765 pound of that commodity costs Answer: 155 pound, 4 shillings, 3 pence, q.

Of all which questions, I omit the work of purpose, that you wall whet your wit thereby at convenient leasure, to clime each branch, and gather the fruit of them, and do minde now, before we make an end of this Rule, to give you some instructions of the Backer rule of Three, whose order is quite contrary to this that you have learned.

Scholar. I thank you heartily for the fix Queflions, which I will (God willing) practife at convenient times: I pray you proceed there-

fore to the Backer or Reverse Rule.

to be the training to the E

end

this exemple base in particular and annound in the complete in

The

The College Roll Light. The Golden Rule, or Rule of Proportion Backward, or Reverse.

Note this well.



Malter.

N the former Rule exerna looke how much the third of ber is greater then the full much the fourth number greater then the second A

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The backer or reverse rule of three.

1014 Kangocontrariwife : look how m the first summe is greater then the third (if it chance to) to much is she fecond fumme and ter then the fourth.

But in this gule, there is a contrary order this: That the greater the third fummers bove the first, the lesser the fourth summer beneath the second: and this rule therefor you may call the Backer or Reverse Rule, with example.

Question of cloth.

If I have bought 30 yards of cloth of two you breadth, and would have Canvas of three you broad to line it Withall, bow many yards should need ?

Scholar. Willby, there is none to broad.

Malter. 3 Doe not care for that, 3 Does this example onely for your easie unders ing: for if I chould put the example ther measures, it would be barder to un Cand, But now to the matter: If you w know this question, let pour numbers as

bid before: but you shall multiply now the first number by the second, and that artieth thereof; you shall divide by the third. which thing if you doe here, I meane if you multiply 30 by 2, it will be 60: which summe if you within by 3 there will appeare 20: where by I know, that if 30 yards of cloth of two yards broad, should be lined with Canvas of Rreadth. Length.

lined with Canvas of Breadth. Length.

three yards broad, 20 2 2 30

yardsof Canvas would

fuffice, as this figure 3 20

themeth.

ort

Example, how say you, perceive you this?

Scholar, mes bir, I suppole.

Malter. Then answer me to this question: bow many Elles of Canvas of hill breadth, will serve to line 20 yards of Say, of three quarters broad?

Scholar. In good faith Sir I cannot tell for I main not how to bring the fummes to like

Denominations.

Malter. Aben will I tell you, with there is mention here of quarters, and again energone of the measures both Elles and yards may be parted into quarters, part them so both in the pradth and length, and then put forth the quarters.

scholar. A ben shall I say thus, Bow may
quarters of Canvas of 5 quarters bload will
also quarters of 3 quarters broades a stadam

mus tradition and a significant for a si

Master

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Mafter. Row antwer to the question.

Scholar, First, I will Breadth, Length, forme thus : for 5 to jop. ned with the queltion, e to therefore the third

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number:then is 3 the number of the fame dem mination, 3 meane because they be both re red to breadth. Row 3 multiply 80 bp 3, it is 240, which I divide by 5, and it peels 48. Then fap 3 that 48 quarters of 5 quare broad, will fuffice to line 80 quarters of the quarters bzoab.

Malter. Turn the quarters againe into El

and yards.

Scholar. Then I fap, that o Ells and the quarters of a yard of ell-Breadth. Lenn bread, will ferbe to line 20 yards of three quarters broad, as this figure

the weth.

Mafter. Now what fay you to this queft I lent my friend 400 pound for 7 monething much money ought he to lend me againe for monethe to recompence my courtefie shewed can you answer to this?

Scholar. Des Str, 3 Moneths, Pos suppose, for 3 will fet mp numbers bowns thus: where 3 multiply 7 into 400, and if maketh 2803, which I divide by 12, and reelde er onnoque de state de la contrata del contrata de la contrata de la contrata del contrata de la contrata del contrata

Millet Anrae the Tame 4 pound into this wings, and then divide it by 12, as you did be-

Scholar. Welt Sir, it thall be bone: so have I o hillings for my quotient, and yet remaineth & hillings dpon my division.

lings into pence, which maketh 96, and bi-

Scholar. So have I done, and I finde 8

Maker. Thus must you alwates doe topen any thing remainest upon your Division, whether it be money, weight, measure, or any kind of thing whatsoever. This rule is so productional exists of men, that so this rule were no more but it all men investment highly to excem Arichmeticke in the Rule may a Captain in Unar, work may things, as spacer Digges in his Scravicosouth declare: Daely now in this my single and incontagement. I will inlarge the Aurhor suith a question of two me, withing you and every my Country was, or gentlemen whatsoever, that by nature was thing given to Visitary affaires, to bee milian and acquainted with this Excellent whe labition acquainted with this Excellent whe labits be that finds not done at the

but alfa in the Campe and Field fervice,

Queilion of a Fort.

abun.

The Golden Rule reverle. 28u abundantly foraite him, bibber in Forth tion i maping of Souldiers wages, charge Ordnance, Powder, Shot, Munitions, and frunents mattocher, as for example, il If it Bould chance a Captaine which 40000 Souldiers to be inclosed with his em That he could have no fresh partievance of the als, and thanshe victuals which thee bad ferve that Army but prety three mimes Ball

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Scholar. As. you is mor ud olis ladte saught me, difet the Monerbs. Men. numbers, thus it top na its if 400000 on Mafter. E. beat it per om sted if antinethe fuffice 40000; (18ing a priding liber if he money, we little guam olodes dol then fabricette. this softentidate To know this; I maltiply the first

ber 3 into the fecond 40000, and it pe 120000, which fumme Andibibe top fiere will be in the quotient 15000, the 36 doe fulftrad from rolling of entitling A dood the re- Monethe, Min mainter will beclare a same 40000 1000 that be mid diminet rod of the string agooo, as this figure on Buen 3000 il.

Queftion of a Fort.

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my.

W gendernen wägstlocher, fint schoules as Medialter. Now unfrom me to this par if 13 6 Majote in a moneth be abter to Hartsa profesou the foliblers from theth and fuch expedition requires he has I would ពេញបន្ល

The Golden Rule reverfe. the same finished in 8 dies : born many morke-Scholar As you saught mee, I let the 36.28 dayes sequire 136 Malons , Imbat number of men by the anal asi the proportion inill 8 dayes require a multiple the fielt number 18 into 136, and it peeldeth me 3808 1, inhich mbedult pumber of Malons that that the of the marke And adjudie thinks thinks queltions are bery easie. Mikon True f you take pelenation bereimportability of the Action of the safe, but words and plost and profitable Honor persone qualtion more's inin bishole: the someta the afe of it in broken aumbers, a for had you the under than ing of broken numbers perfectly not onely in this Rule but mall other, the question that in the light, or appearance feemeth to be 100 times more hars ber to absolve, may thereby be wrought as cone,02 Cooner then this. Scholar Pour words do greatly incourage to be fructous to attaine whole numbers : might I once attain to be a practitioner broken numbers, I thouto think my felte App:

Malter.

Master, what say you then to this question 48 forners in two dayes make 200 light has mem staves (esteeming they worke but 12 hours aday) and such need require the that 384 low are set to the sinishing of those 200 states, what time say you, will they make them up?

Scholar. I see here

bers thas:

Saying, IC 48 men are 24 hours, 384

in ill make an end quick. For it is grown

apon an old Proberb, many hands make
theed.

I multiply 48 into 24, and it amounts
11, 12, which I bivide by 384, and my a
2 int is three boares, which is my believe
2 in take this for a note worth; the marking

ther in the Rule of Three formald, or bat when the two numbers are multiplyed to the Product is of the same nature and dem tion that the second number is of the

armice feeting to the social mass has the authors, mass has the authors, mass thereby he to augus as

tholar flour focids so arealts incomage one and ones attains whatemanders: might I ones attain to due practicioner volven numbers, it would third any lette

Mafter.

Note.

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1381 The Golden Rule double The double Rule of Pros horse much start of miles coff : Start noirogo Stren und tole a roftem beleef emen Ette fich you perceive now thouse The douof which enfue of the fame, and first she Daubla Bule, which is fo called, because cherensino in denble working, by lwhich things onely it different Meffer. These and such other likethand andcholan Aben by an example I hall uns answered much sooney dayonallant Di dung Miliera Saftadby on and dentha bethe coloned Question In Ifsbarents Brudf 1 00 metholithat is 112 of carriage nd) up hitsed of 12 proper what minds will' the carriage ofogoo Weighor ofte being carried Scholar: Bir, 3 thanke weu muthalim holis dipper you their me the working ended, that I map fee how I map behat Meler You malt make two workings office that I have ever and giant aftered the Mit penices how much stu K meight) Butaci while hundred weight in the will abisw off Set your figures Malter. Bet pet a tobile ins will go one abmoltiples by 112, and thereaf amount 60, which if you divide by one the mos. of fewing in one year 260, how insoling 500 the Eben begin the facond worke, faying salf

The Golden Rule double.

30 miles cost 69 pence, Miles. Price how much will 100 30 Zonilles cost 8 See your allocation of figure thus:

Then multiply 100 by 60, substept amount esty odos, subtet being bloided by 30 in slave zood pence. Then you may say, that for plance shall odisthe carriage of 500 per weight 100 invies) after the rate of representation in Scholar shows a perceive it also.

Master. These and such other like quein

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Majter. These and such other like quit one of the double Rule of Three, are role answered much sooner, aromellonely works by the Rule of Proportion composed of mumbers. Obligo anon Mwill them you, a short when you have the ase thereof, you in the its which may you thinks good.

Scholar. Str, I thanke you muth fore continue. And I tong note that he Rule ended, that I may see how I may behave selfe with that new Rule of five oximbers that I have ever time you taught me blist in the Golden Rule, both forward and he ward, wanght but soith Three numbers onely.

Maker. But yet a while we will go of the will go of the will go of the will go of the difference that the will be still go of the will be still go of the will be still go of the will go

Question of fowing.

of Inter thather of wheat lively years one year 360, how many will so the years of I means, allowing do

Carries

Scholan First & fay, that it go bufnels will recial good in one year, then 86 bushels upteld 960 in one year. Then for the fecondworks I fan; If one year veeld 960, the preas will yeeld 67 to; as thefe two renderfrewatt to observat sit aistit dien' Rande in (eg. topich the letters do declare, h that the increase of the feventh weather to Sign Encreafe. Year Encreafe

that it of the many and see on the total

But now Sir, if I fet forth 30 bushels of Corn Questin subs man for 7 years, agreeing so that hee of Con for every yeare the whole increase of the Corn, and I at the end of these 7 years to have the alfoof the Whole increase: I would know how the increase to bee after the rate of the last fion, for 30 bushels in one year to yeeld 360? Malter In fuch a question pou must habe many severall tyoukings as there be can as for example. In the first year 30 whele peeled 369: then to know the peeloof the fecond year, I must say, If 30 160, how many yeeldeth 360? Worke your Rule, and you thall finde 4320. a lan, for the third year: If 30 yeard how many will 4339 yeeld? you thall \$ 1840, and so every year multiply the whole increase by 360, and pividing Schola

amount as these 7 figures sollowing book berly beclare: where I have set 7 letters the 7 years of which the first is soulistly Art, because that is the increase which was presuppose: and the last number of carbon both them the increase of that years that the increase of that years that the increase of the seventh year, 1074934240 bushells: bow many was that is, and also how many water you may be Reduction soon ands.

Pine C

Question Now with one question more I will proof mowing you. If fix. Mowers due mow 45 acres in fix dayes, how many Mowers will be 300 Acres in fix dayes?

Schola

Scholar, 31 as Acres rennie & Mowere then 400 Acres require 400 Bow againe, it ounges require 46 mowers, then 6 dayes

the Hindapolog poil not make mention ou that remaineth in the last District laft part of the question to wood by neter Rule, where the mill humber of is mounteth 188, which it you brothe by theth rd number 6, the quotient will bee 3 3,00 wall o but then will there remaine & which mit well be bilibed into 6 parts : bowbeit mire part of one mans worke, which pour me put to the 33; or elle you must say that Workemen will end all the 300 Acres in Myes lave 2 mens worke for one day, or 2 Me Worke for one man. Tut fuch bioken numbers called fractions, pour Walf hereafter me better perceive, when I thall wholly inthat pu of them.

Matter Yet one question more of feld marter I will propone, and so I will make an end of this

Wille Raile of Three.

Scholar, With all my beart. Str 3 thanke and I will offpatch it as foone as I can male I would faine fee the order of the next me of a numbers,

Matter. If a Captaine over a band of men did of entren. d atrench of 100 Rods: I demand how many Labourers

Question

labourers will be cole mitte like trench in the houses, to immench a Compart 3 400 Rods in

Scholar, A thinke A am now in the Bad house dirch : to; I know not well which to go shout it. And besides that truly 3 mi Schull never come to preferment that income the latt parce of the quest illamed at dividuo

Malter. **Fon imely not beto** Dad may a phereafter by knowledge and ferbice tanour of your Prince, for the abella which our ber 6, the guorient-Hantano Tung

Frample for Navigation Sin Francis Ind. was not the callest man and yet hather as great an adventure for the chonour of Prince and Country, as ever English

Scholar. Sir, I thanke pon top pour an incouragement. Dy minue, shough I be lim th as befrom of thom in their only a modern babe ponded now a 4990 mill little of it, and thus I have 3400 And let forth the boulses and for a story and disea and

Saying, If 200 Rod require 300 men, wh Chall 3400 rods, required i multiply 3490 300, and it yeeldeth i proppe, which I dis by 200, and my quotient is 5.100 men- signif

When must I lay for the second was shi in 8 houres 5100 men be able to discharge how many thall performe the same in the houres? Row it 3 would make by thing

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rale ditto Golden Rule of Proportion forward, I should since a level mamber of men: became three boures is telled then 8 houres; but became reason tenantiff ence, that the lotter the stine is, wherein the trench must bee made, the more planates I length to have thereupon I now the Backet Rule, as in example And I bake in my Quotients is good. So many Ployner and I bake to intrench the Galage in three houres.

Missen Hou dave unstructed the question bepartificially a And truly I commend you so partificially a And truly I commend you so partificially in whole multiplies by him hou a little talk of the Releof proportion compounded of five dumentally is adoption to the land it was a little talk of the Releof proportion compounded of five dumentally is adoptional to the land it was a little talk of the

I the correge of 1 C weight 30 miles of so weight

fond me in ter gearried 100 miles?

 The first pured the mile of on compound, pound, dire t.

Colden Rule of Proportion forward & foods The Rule of Propertion

compoled of salumbers oin the cience mind see made, the most

The first part of the rule of propertion compound, dire 1.

He Wille of Propert lines is difficult for mo franced at stions anto several portugate and k that is 11 thirdle her who do in home to it alwayes firemund

for fi party who for and plumben and place (M.) and mayesiof one nature and like dementilisoning Rule li to be arough the gon migloson siles first number by the second said that shall be per dealth by Division: Then again, underly the order for bers, the one by the other, and their broduct su be your Dividend.

And now according to mp promife, we'll first worke the question of weight and com age, which I delivered pout in the double me of three, to bee absolved by this rule, will

ipas this.

If the carriage of L C weight 30 miles of 12 pence, what will the carriage of 5 C well stand me in, being carried 100 miles ?

C.weight. Miles. Pence. C. weight. Miles. p1 ____ 30 ___ 12 ___ 5 ___ -100

pow marke well bow there five n bers fand : Then multiply the first numb by the second, as 30 by 1, which maketh

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by hel Golden Rute compound. 2195 Held things Reco to your Divider Then state of the Control oldes por that of the op the Product of the twoffelt numbers, which bere is 360 And you le there is cound 200 pence, which is the onty boweller & Hilles, afterthe rate of The bence a hundred, and agreeth with the conclusion of the What comes the interpritt 18 91919 Blaches finter fr ai Scholaf Sir Athank you, it is even fo. Mafter. Tet more this in a generality in this Note this. Well look what nature or denemination your midof Menumber is of (which here are penel) and of the E meldehollithakon br martir vis dimaye is bur quo-"Scholar Carett now and it it please you, by pour patience, I will tee how I can end the question, next following of 30 Buffiels of ,00% dischoog vang saure dida down dischoog in the little o am Bu Bullels 10 Buft. Year Buft. Buft. Year pulleding years 1130 111360 80-7 reclaring soo, and the thursdishing ireft thologistore problem pallettime MedBullelyn uns : 0028866 soldid T pounds. Ellen according of gendioisa de me beretstene, I turne the 78nomes they let me hittibers a aprillizos adollei

the first number, mp Quotient to the

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THE SERVE STATE OF THE STREET nore Direct; then maltinion the other the members the one into the silve de 1955 arm The property of the party of th inthelaume pears, dor so much allo it, came inthing moralens by the Rule of Living population of annia gone and to keeps this this this a please wood bereafter, the a man many What comes the inter-ft of 238 point differen Queftion monathad a reflect shorted of & pound office of Interest We repround for 12 monaths () 1911 M 12 -15 M Scholar Sir, this is yet within them palle of fome reasonable plante: fherefort minister agaity in this case. A will see how can toozke the fame, which diffet to me odi monerby die light thus maringaput has a said the a dans not done wallelled iran, nothing theat folucion to the supresentmentales ot Mafter. Proceed, you babe pour pare Scholas Aben 3 Doubt not best be and peeletholeoo, and the threa other work multipled together produce 1843 30 .1 I divide by 1200: and my Quarismal pounds. Athen according as pondesha im me beretofoje, I turne the 7500 naund 3 left dutio dillings, and phiping, th the first number, mp Quotient is the 1:14 55

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196 The Golden Rule compound.

The Golden Rule compound: 8497 lings do 3 antiops, that the loans of 258 nound to 5 moneths, after the rate of 8 Proportion componers in the responding of

Mafter. You fay true, I commend your diligence:now behold the manner of the fecond

part of this Rule.

'n



Wile ferendpart of sois Rule Proportion composed, the third number is like unto the first. And the Rule is to bee Woonght thus en look now contrary to the last

Rule, multiply the third number and the lower together, end that product fall be your Divilor. Then multiply the fire by the focused, and the product thereof by the first and char inthe numpoints this question, for a proofe of implain

> din proof of the laft euchicn.

question of interest. millings for interest of certains money for of the pound in the 100, for a year. The quelier is now, bow much money Was delivered to will this interest.

Gloda al

li, monethis. It moneths, Il. therefore the Wenter hour the question Manicher on fire to 13

fo fet foatig.

Scholar, Sle, I perceive it very well ! accordin

The Backer Rule, or the grant from the Backer Rule of the Rule of the Proportion compound.

by bearing and and Marter becoud

N the second part of this Rule of Proportion composed, the this number is like unto the first. It the Rule is to bee Wrought thus. You shall now contrary to the last

Rule, multiply the third number and the four together, and that product shall be your Divisor. Then multiply the fift by the second, and in product thereof by the first: and that is the nuber that shall be divided. For example, In pound this question, so, a proofe of my a question of interest.

The proof of the last questions

A Merchant hath received 8 pound in shillings for interest of certaine money in moneths terme, which he received after them of 8 pound in the 100, for a year. The quite is now, how much money was delivered to to this interest.

therefore the li, moneths. li, moneths. manner both 100—12—8—5—the question is set south.

Scholar. Sir, I perceive it very well :

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The Golden Rule compound. 199

bed for the working thereof: if it please you now it is let down. I thinke I can follow the worker.

Mister. Pay stay a while. and before you work, mark well how I deliver a reason sor the persent understanding of this Rule, which is thus: If 8 pound in 12 moneths do yeeld nee 100 pound, to take 8 pound 12 shillings for 5 moneths, must needs yeeld a great deale wore.

Note:

this Art, The first part of this Rule is answerable to the rule of Three forward: and this latter part accordeth to the rule of Three backward.

Schol. Sir, I peeld you most hearty thanks so the pour last instructions, they have given me great light into these two rules, where by I may the better by deliberation conceive motouse them hereafter when occasion shall course.

Milter. You say well, go to now if you will and try your counting in the question: But is Bote take with you by the way, in No.e. whose here is mention made of skillings, wall your more east to work into skillings, show Afte please you to behold me a little, whom Afte please you to behold me a little, whom Afte please you to behold me a little, whom Afte please you to behold me a little, whom After please you to behold me a little, who all the please you to be hold me a little, who all the please you to be hold me a little, who we have you would be seen and my last number to be multipliful seether so, my dividend: And my third

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into my fourth for my Divisor.

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12	200 1 5 1 1	5	no pour
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24000	lar, Pista	w mig-li	Act, The fi
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48000 4128000(168000 8 00 24000

quotient is 5160 shillings, which in pour perfeth 258, my desire.

Their istical adi asmed

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atr.

Master. 3 will here for this time de will numbers end this Rule, and 3 will have you in the Rules of Fellowship. Pour may your, convenient, leasure for your more worke the same by the Rule of This twice. And so your nide and successed therein, 3 set downe here a profess has apply if and all remains the great in brood apply if and all remains the great time brood apply if and all remains the great time brood apply if and all remains the great time brood apply if and all remains the great time brood.

The Rule of Fellowship. 201

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f. Pound. li.

12 412; l. 412; 258 li.

The Rule of Relow-Diomitine

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Rale of Fellowflip or Company, which bath fundry operationly, which bath fundry operations according to the diverse finite is former me without difference of time, and dometimes there is a difference of time, it is former to be a without difference of time, there is a difference of time, it is formed to the control of t

Four Accordance of one Company made about of money directly: for the hirle laid in 30 pound, the feece of so pound, and the feece of so pound, and the feece of the county of the feece of the county found each of seventh the pound. Note the series with the pound of the county found each of sevenths.

Perform Las properties that this Hole is the 18 of the 19 line of the 18 of the performance is a difference is the 3 percent of the 18 o

Malter, j. Spentarii A deriv it to pen 1 files Addiesoo, pontified bring, all the gartler tunimes of the Meridense into one same topice feel ne-the them we in pose teeth in the Colden Rule, and the tabole the of the gaines by that flecke that the child bes the condimmer, glade (o) the chied functor of

The Rule of Fellowship.

The Rule of Fellowship without time,



Ut now will I shew you of the Rule of Fellowship or Company, which hath sundry openations according to the diversumber of the Company. The

Rule is sometime without difference of time, and sometimes there is in it difference of time. First I will speak of that without difference of time, of which let this be an example.

A question of company.

Four Merchants of one Company made about of money diversly: for the first laid in 30 point, the second 50 pound, the third 60 pound, at the fourth 100 pound, which stock they occupy long, till it was increased to 3000 pound. Not demand of you what should each receive at parting of this money.

Scholar. I perceive that this Rule is it

I perceibe not.

Master. Then will I shew it to you: It by Addition, you shall bring all the particular summes of the Merchants into one sum which shall be the first summe in your work by the Golden Rule, and the whole sum of the gaines by that stocke shall bee the cond summe, Pow so, the third summe

The Rule of F	ellowihip.	385	- 3
cach man one after and ther, and then work	q quitod; cor:	1130	
to the Golden Rule, and the fourth fumme will man you each mans	h a con our a	100	
pic.	in tie there a	Peroc:	
the parcels of their have fumme 240 pour	foure Merchar inds: fet that	in the	Novi
find fecond, and the find mans portion of flocke in the third	1 100 30 Z	3000 Sch	
plus thus: sow multiply the land will be 20000, it	dich you wal	dintoe	,
19140, and there will thus: And that is the gaine to the first man.	eles Horet me ele	3000	
nu let the 50 pound the	at be brought	in the	TO A
likewife for the thirm, let his money	his figure theb	efb.	enof
the part of gaines ill be 750 pounds, as b	50 62	T	
माय महर् देस स्पेशा सह अव		din-	. ,

The Rule of Fellowship. And so for the fourth man ; if pou fet bis fun bich is 100 pound, bis aines will bee 1255 oth pound, as the work will betlare. 30cd Scholar. This I per terve: but is there any 100 _ 1250 wap to examine whether have wel done or not Malter. For the triall bereof, abbe foor all their fode portions, and if their apply Note this make the whole fumme of their gains, the common the work well done. Scholar, That will a fri by and by , the foure parcets are these which added tones er make 3000 jubich is fibe famme of money they gained, whereby 3 know the work is spell done. Malter Mell; now another example will I put to you, not of gaines

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of loffe, for one reason ferbeth to: both.

If three merchants in one ship, and of one A question of losse. low hip, had bought merchandise, so that the bad laid out 200 pound, the second 300 p the third 500 pound, and it chanced by te that they did cast over board into the Seal chandise of the value of 100 pound, how should each man beare in this lose?

Scholar. It I wall to in this, as you of

the other question, then must I topne their three portions together 200, 300, 500, tobich maketh 1000. Then fay 3, if 1000 lose 100 then thall 200 lafe 20, and 30 thall lofe 30, and 100 thall lofe 53, as by the three figures tt both appear plaine.

3c. bi gitton, mair 1000 100 2007 20 300 haleldus, 1000 Took

Mifter. Well, fith noin you have done thefe I will propound a queltion of more importance, twich thall make you not onely the abler to understand this Rule, but also it will greatin all pott in the next Rule of Fellowship with rime if fach need be that your mone v be of blurs denominations.

safer this map not be forgotten in all fuch questions: If the number be of others kinds. mumuf by reduction ining it into one kinde, that is to fap, to the least value that is named inthe question. And likewise that you doe, fift timebe of diverskindes, as fome peers, fome moneths, weeks, and daves, you hall make all moneths, weeks or dayes, according the least name of time in the question is, as m erample.

First in diversity of money. Three companions A question ought 2000 sheep, and paid for them 241 pound of sheep. -4 pence, of which sum one paid 101 pound

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Solution.

pound 10 shillings. The second 82 pound, in this sings 10 pence. And the third paid 57 pound 5 shillings 6 pence. How many sheep must each of them have? Answer: The first shill have 840. The second 686. And the third 474 And that must you work thus.

First, considering that your money is a divers denominations, you shall (by redulion bying it all into the smallest denomination which is in it, that is to say, pence, and so he

the Totall fumme be 58000 pence.

pence also, the first mans summe will to 24360 pence: The second mans money will be 19894 pence; and the third mans money

will be 13746 pence.

Bow to know how many theep every medial bave, let the whole famme of money, it is 3 8000 pence be fet in the first place, and the second place set the number of sheep, in then operly in the third place set each money, and then multiplying the third and second sums together, and dividing that it amounteth by the first, there will appear in number of sheep that each man ought to have these three figures to their.

1800 2000 58000 2000 19894 686

58000 7 2000 13746 474

Scholar. Will be boe pou let the money in the first place, feeting in the question you lay 2000 her tof 58000 pence, and not thus: 58000 as tooothe person tol : s diana att tag

Maler. Pouremember 3 taught you at the winning of the Golden Rule, that the first mi third numbers must be of one name, and of the things : and evermore the number that the question is asked of, must bee set in the third place.

New is the question plainly this ! If foure men bought 2000 sheep for \$8000 pence, how many sheep shall each man have

But feeing in this queltion , there ought me respect to be had to the summe of money the to the summe of the persons (for in the of money to their proportion toward Wheep and not in the number of perfons!)

If 58000 pence bought 2000 sheepe, how and did 24360 buy? Againe, bum many did 9894 pence buy? And how many bought here, tiot onete fiote mann I & sont

Scholar. I perceibe it reasonably, and fo Alban ancidon beilginet onely

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thall 3 boe in all queftions.

Mafter. Chen fo. But foz ealineffe of the mothe, marke this : Tall henfoeber the fe and fecond numbers babe cyphers in the fal places, pou map both in the Multiplication and in the Division leade out those cyphen fo that you leave out like many out of bei fummes, as in this question, the first number s 8000 bath three exphered and to bath the conditiates 2000 : therefore taff a wan gyphers, and to will the first number be ! and the fecond 2: fet them in their pla and morke accorbing to the Rule, and thall perceive that will be all one labing this is the thoster and eafier war, as t ithree figures Do theward's das t banist sell squeltion is asked of much bee ict in the

a confidence of the painty of the confidence of

but feeleg in tiste 18210m, ibete englis merefpric to 18440 - 34 (some of morey un to the famine of the nations lot in the

the more tertains may to know the anim

Scholar, Truth it is as you say: Making seemeth I might aske a further quelibere, not onely boto many sheep each should have but also whatever sheep ask Master. That question both not onely

Note.

long to this Rule, but may also be discutted by Division, especially if the questions number be one onelp; as thus: Divide the totall fomme (8000 pence by 2000(02 58 bp 2) omitting the cyphers, and the quotient will be 29 pence. that is 2 fhillings's pence. Howbeit by this Rale pou may doe it, and beft when the nam. ber of the question bath exceed a signif I hould aske this question, 2000 freep coff: 58000 2000 pence, boto much no 20 rote Then thall 3 let my faures as before.

And boing after the rule, there will amount 180 pence, that 18,2 pound 8 hillings 4 pence the mice of one scare: but if you will use that easte way that I old teach

pounding poin may change to a min 2 37 58 the first and fecond num-

ad of 10 moneths. The deeped matuff to This do you perceive the use of the Rule one pound, for faven moner's smithedhim

Scholar. All this I under Sand perp well: how popular instruct me in the Mule of district other listers, smith differ different

entrall the third places of the figure wan bid let est mans fumme alone, bere pen fault let thein today unaltipleed by the namber of their in and the wife in the first place of the figures

Distribution and the contest of the second to be the second to fummers to multiplied by their times.

absett into one intole fundere stiffer.

The Rule of Fellowship with time.

Mafter.

The Rule of Fellowship with time. O the intent you may as a perceive the same Rule of diversity of time, I properties example.

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Wor

Foure merchants make common stocke, which a

years end was increased to 35145 pound. In to know what shall be each mans portion of sa you must know each mans stock, and time of a tinuance.

Question of a Bank.

The first man of these source laid in 66 which he did take from the stock agains at end of 10 moneths. The second man will 810 pound for 8 moneths. The third his 900 pound, for seven moneths. And the seven laid in 1040, for 14 moneths.

Note. A generall rule,

bit the other before, laving that where the third place of the figure you did let mans summe alone, here you shall set this being multiplyed by the number of their and likewise in the first place of the figure shall set the number which amountethold whole summes so multiplyed by their time, about into one whole summe, as thus.

Sloon

The first mans summe is 669 pounds, which a multiply by 10 (that was the number of his time) and it maketh 6690. The second mans summe 810 pound, multiplied by 8 (which was his time) maketh 6480. The third mans sum 900 pound, multiplied by 7 (so; that was his time) yeeloeth 6300. The fourth mans summe was 1040 pound, and his time 12: multiply the one by the other, and it will be 12480.

the foure summes thus multiplied by their time, must be set orderly in the third place of the figure, and in the first place must bee set the whole summe of all foure, which is 31950; and the gaine must be in the second place, which is 35145. Pow to and the que-

Mon, Ilay first, It

3195 0 Did get

35145, what did 31950 6690 get & Answer, 6690

7359 pounds, as by

Thewise, the second man had to his part 128 pound, the third must have 6930 pounds, and the fourth man that have so his his 13728 pounds, as these figures to partly take.

Royk is welt toner Fisher. It (class out oligerissie, bee fare

is not incli.

Matter, Schoon are unting other excited

Scholar. This 3 like very well but the

Another

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proofe is there of this worke?

Mafter. The fame that I taught point the other: bowbett, there is also both to the isork and the other allo, this manner of posto adde all the portions together, and it magree to the whole summe, then seems your work well done: but this is no be proofe.

Scholar. Det will approve in this example: The foure parcels are these, which if a adde together, there will approve the whole immine, whereby a perceive the isouk is well done.

Master. If it fall out otherwise, bee in is not well.

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mas, and the

et a spould

Scholar. Then do I understand this is also very well: But what have I now

Mafter. Where are many other end

parts behinde, of trhich I will not as now make moutton, because that totthout the montebes of Fractions they cannot bet paely taught, and much leffe understood. Chartese will 3 propose to you two or there questions maze (that thereby pour my better perceive the use of this Rule and dent the like) and to make an eife for fors Timen bid try asm baces spicia

Three Partners by forme ill adventure Suffaiwather toffer of 100 pound, whereof the first the die common flocke 2 do bound, for ten Month, the second laid in 350 pounds, and the and nown: But browning off their purenership, the first found himselfe a luser 80 pound, the feand 36 pound; and the third 24 pound. The quelid to, for how long time was the money of distributed the company . All of the company

(4

for the folution bereof, and of fact other line poin made and the intelligible fifth mans 200 pound, that bee put into the stock by his imestrontinuante, hopich was to modeths; the E won scottendar cope disham the William purious that the so pound will be and the state soot what and the miney make that test to pound, and the that may bounds to be a substitute a substitute of the substitute of th minima of the sails of the continuous for the saint saint gs, thus: to animper to fuch ether like.

min sognic babo, tonney every 4. Million grov account thinking their son and

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To conclude, if you note divide 1400, fecond mans portion, by 250, which was stocke that be laid into company, por finde in pour quotient 4 moneths, and long time bib the fecond man put his mo tuto the common flockes

Lattly, if you bibibe the third mans laping in, which was 600 by 100, which is his stocke that he put info company, the tient beclareth his time of continuance, w mas fix moneths. And thus is the question folbeb.

Scholar, Sir, 3 babe attentibely bei your working, and the more we travell in in, the moze me thinke I am in love within excellent Art.

Master. Then what say you to this we ftion?

A question

There is in a Cathedrall Church 20 Ca of Canons and 30 Vicars, those may Bend by year! pound, but every Canon must have to bu five times formuch as every Vicar barb: how se every mans portion, fay your all off

Scholar. I may you make the antiner felse also, so shall I perceive best the m to unfiner to fuch other like.

Mafter. In this Question pon mult as in those beforefaid, that have bivers

The Rule of Fellowship. 215

leine, to bere to other the of portions. Therefore hall you multiply the number of the petlons by their difference of portions: (as you
with in the other by time:) Then must you
multiply the 20 (which is the number of Canous) by i. to that is the number of their
poston) to will it be 100. Then 30, (that
is the number of Vicars) by I (that is the numbber of their portion) and it will be 30: put
these two summes together, and they make
130. Then say thus; If 130 spend 2600
pounds, what may 100 spend? The Rule
beweth 1000 pounds.

Again for Vicars: If 130 spend 2600 pound that may 30 spend & Answer, 600 pound, as

thele figures thew.

130 Z2600 100 Z2000

130 Z 3600 30 Z 600

But if every Canon should have so often times 4 pound as the Vicar should have 3 pound, then should I multiply 20 by 4, (that were 80) and 30 by 3, (that were 90) and ben both were 170. Then should the figures e set as followeth.

li. f. d. li. f. d. 270 Z26000 go Z1376,-9,5

But this fort is too bard for you, by rea-

The rule of Fellowship. 216 Tom of the fragions, therefore I will let it m for they place.

Sing he this rule pon fee in hat the 20 G.

none may feend; in hitch farmes, if you didn

by 20, you have reased Canons portion; a

lo of the Vicars, if you binibe their farmes 12 risi al 9.0 39, the quotient will beclare chery Via 200 Portion (1.01) 1 qui(2, cold to raine in the 965 in a coasta libra its Ap Whalten along 1889 200 de riva function together . The there made 1 was not this you have tennished Total Linde of Mathmetick with 114 The feet for the lane of spanial setsiano in was not sometylished the war the andread but also for them that cann do bo page nit at longe time their pen o be tot to in two feither common T The A. s.by lines, and the other initioni line. Hart thee the thee be teach of nf dates and in the third hein of he felth teek freed to com-inall assuide bath thirdens 10 O nes, oun to an a self segment to oach and allowed ep [Scho aslaniats go Pou -30/33436 133134 Mar De li os erannale times fide fette pett IET tight their car dang being being being

The second Dialogue.

divinity of Learning

The accounting by Counters.

Master.



Ow that you have learned the kinde of Arithmetick with the Pen, you shall see the same Art in Counters: which feat doth not onely sorve for them that

to both; but have not at some time their pen or ta-

les ready with them.

This fort is in two formes commonly, the one by times, and the other without lines. In that that hath lines, the lines do Cand for some of places: and in that that bath no mes, there must be let in their clead to many ounters as thall need, for each line one; and ep hall supply the clead of lines.

Numeration by

nethermolf franceto to the firthiplace, and a next about to for the fecond, and fo upber Counters. fill you come to the highelt, which is the fin line and francett for the fixth place.

Row what to the value of every place line, you may perceive up the figure which have let on them! Which is according are learned before in Numeration of figures buthe Pen, for the first place is the place of pine oz ones, and every counter fet in that line, h tokeneth but one : and the fecond line is place of 10, for every counter there flan to to: the third line the place of hunde the fourth of thousands, and lo forth.

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Scholar. Sir, 3 doe perceive that the order is here of lines, as was in the other gares by places, so that you thall not need in ger to frand about Numeration, except thank anwother difference.

Mafter. If you do understand it, then bow will pon let 1543 ? In 12*1-

Scholar. Thus as 3 luppole. Mafter, Dou bave fet the places trulp, but your figures be not meet 3

for this ule: for the meetell figures in this be.* balle, is the figure of acounter round, as pour fee bere, where I babe,

explessed that same fumme.

Scholar, So that you have not one il

digits as you have, so many counters you let in the local line, and lo source was let one in the second line, and look other But I know not by what reasons you let that one Counter to say that the counter to say that the two lines, may gazy E. that

Masteris you need to set downe 5, 50,02 500,03 5000,03 5000,03 set forth any number whose numerator is 5, you shall set one counter sort in the next place above the line that it has bis denomination of: As in this example of that 500, because the numerator is 5, it must be set in a boid space, and because the denomination is a hundred, I know that the place is the boid place next above hundreds, that is to small be the third line.

And further you shall marke, that in all woking by this sort, if you shall set downe up lannie between 4 and 10.

In the first part of that number you shall set downe 5, and 60.

In the numbers more, 6 as there rest numbers above 6. And this is true both of 6 digits and arcicles. And sort manple, I will set down this 6 mane 197965, which 60.

In the pour marke well, you 6 and none other examples sor 6 and 60.

I learne the numeration of 6 its source.

But this that you marke, that as young in other kinges of Arithmetick, let a patchin the places of thousands, in this most your fet a Starte; as you fee before. an oan odl n

Scholar. Then 3 perceive Numeration But, I pray you, how that I do in this An to abbe tipo fummes of more togethers with

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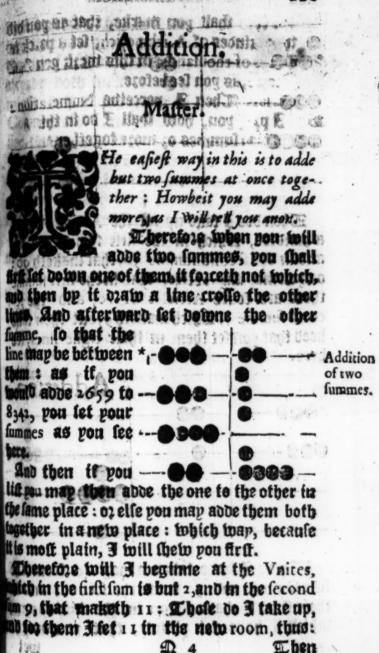
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Then boo I take up all the Articles un a bumbled, inbich in the first summe are and in the fecond fumme 50, that maketh on or you may tap better, that in the first fum there are foure Arricles of 10, and the cond fumme ; which maketh of but then the beed that you let them in their right lines !! bere.



There I have taken a way 40 from the first summe, and 30 from the second, and their fead I have let go in the third room which I have let plainly, that you might lith

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B 10

ing that 90 with the 10 might was in the third room, already both make 100, 3 might better for those 6 Gounters, set 1 in the third line, thus:

- for it is all in one fum,

as youmay fee, but it is best never to let five counters in any line, for that may become with one counter in a higher place.

Scholar. I judge that good reason, for ma-

Maker. Mell, then will I added to the fundreds: I finde 3 in the fact finding and 6 in the fact finding and 6 in the fact finding and 6 in the fact finding, where is 100 already, to which I put 900, and it will be 1000: therefore I fet one counter in the fourth line for them all, as you fee here.



the made I the thousands together, it in the first summe are 8000, and in the

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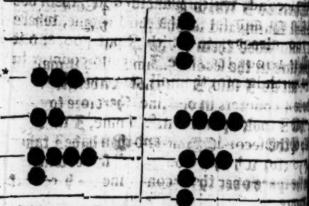
To adde fummes together. the fecend 2000, that maketh 10000, the boe I take up for those time places, and is them I fet one counter in the afth line on then it appeareth as you fee to the line on bee 11001, for so many both and law amount of the Addition of the Addition of 1242 to 2659.

Scholar. Sir, this I bo per tell to be the state of the s

Mafter. sparke well bom

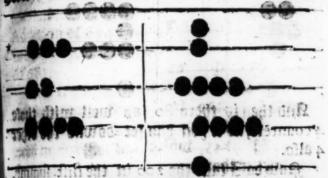
3 doe it. I will abor together
65436 and 3245, inhich first

3 fet bowne thus:



nomination, which is 1 in the second summer and set it in his place: then doe I finde state the first summe, and 5 in the second, which we put together, sabing the two Counters, can be the second to the second together.

belet in a both place of 5, but for them both anuft set one in the second line, which is the place of 10, therefore I take up the sive of the sink summe, and the 5 of the second, and so them I set one in the second line, as per second.



then bo I likewise take the 4 Counters of the state some and second line, (which maket) and some them to the 4 counters of the similar in the second summe, and tomaketh so but as I sate, I may not combentently set about 4 counters in one line, sherefore to those 4 that I took up in the first summe, I take one altoot the second summe, and then have I taken up 50: for which I counters I set vowne one in the space over the second line, as here both presere.

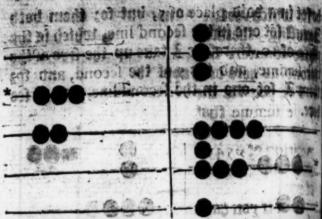
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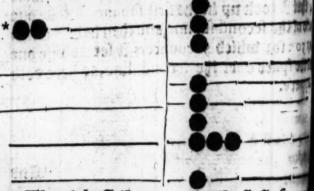
Addition.



And then is there 80, as well with the 4 counters, as if you had let botome the other

4 alfo.

Row to I take the 200 in the first summe, and adde them to the 400 in the second summe and it maketh 600, therefore I take up two counters in the first summe, and them them in the second summe, and the them is the second summe, and the them is set in the space above, thus:



Then take I the 3000 in the first fumn

ani

into topic) there are none in the second fum agreeing, therefore I doe onely remote those there counters from the first fumme into the second, as here both appear.

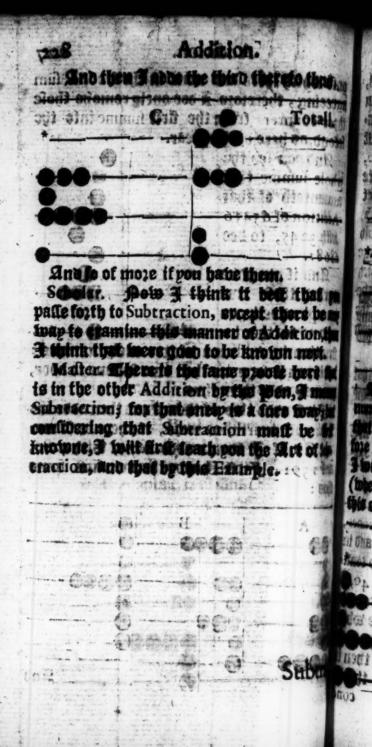
And you fee the	
whole fumme that	-036
amounteth of that	
Addition of 65436	-000
with 3245, to bee	
And if pon babe	

market those from the state of the state of

trutton in Addicion of two onely fumines:
in if you have more then two fumines to adde,
manage above them thus side A route and manage them.

historical and the of them, and then adde the historical fourth, or more; if there he to make: As if A would adde 2679, with 4286, and 1391. First A adde the two first sums that:

A	В	(60)
3		000.
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mark.		And

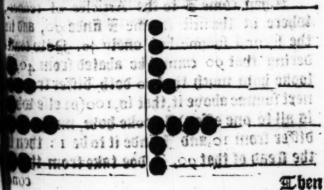


Subtraction.

Would subtract 2892 out of 8746. These summer must I for downe as I did in Addition a hat bere it is best to set the leffer number first, thus:



where shall 3 begin to subtract the greatest members first (contrary to the use of the Pen) at is the thousand in this example: therefore I sind amongst the thousands 2 for which I bithdrate layurny from the second summe, (were are 8) and so remaineth there 6, as this example themseth.



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Then doe I likewise with the hundred of which in the first summe I sinde 8, and the second summe but 7, out of which I want take 2, therefore this must I doe: I make look how much my summe differest from which I sinde here to be 2, then must I always for my summe of 800, one thousand, and so do not the excelle of hundreds, that is to be take up:therefore from the first summe I me that 800 and from the second summe (who are 6000) I take up one thousand, and length for that are there already, and make the 900, thus:

Cooo I de la companya de la companya

Then come I to the Articles of tems where in the first summe I finde 90, and the second summe but onely 40. Power dering that 90 cannot be abated from 40 looke how much that 90 both differ from next summe above it, that is, 100(0; else with all to one effect) I looke how much of differ from 10, and I finde it to be 1: that the stead of that 90, I doe take from the

rond fumme 100: but considering that is 10 too much. I fet downe In the next line be: * neath for it, as pou fee abing that bere 3 ham fet i Counter in the force in fread of c thenert line. Anthor have I subtracted all fave 2, tobich mut shate from 6 and there will remin 4, thus: bo that if I lub: trac 2892 from 8746, the remainer will be 5854: And that this is truely wrought, pour may nobe by Addition : for if you adde to this re-

miner, the same summe that you did subtract, ben will the sozmer summe 8746 amount

Scholar. What will I prove, and first I A proofe fumme that was fubtracted, which of Subra-132, and then the remainer 5854,

Then



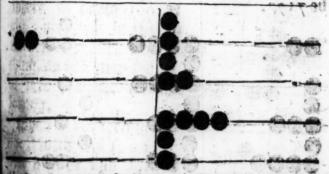
Then do I adde the first 2 to 4, which we keth 6: so take I up 5 of those counters, we in their stead I set 1 in the space, and one the lowest line, as here appeareth.



Then doe I adde the 90 nert above, his 50, and it maketh 140, therefore I take those 6 counters, and for them I let 1 the hundreds in the third line and 4 in the line, thus:



Then do I come to the hundreds, of twhich I have 8 in the first summe, and 8 in the fecond, that maketh 1600, therefore I take up those 8 counters, and in their fread I set 1 in the sourch line, and 1 in the space next beneath; and in the third line, as you may see here.



Then is there left in the first summe but mily 2000, and in the second 5000, which I shall take up from themes, the time that is there already: and there whole summe appeare; as you may bell see, to bee 8746, which was the suit of the grosse

tried by Addition. Scholar. I perceibe the fame ozder ben with counters, that I learned before in figure

Master. Then let me see how you can to

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Addition by Subtraction.

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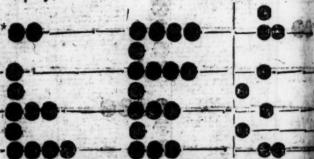
fore.

Scholar. First, I will let forth this example of Addition, where I have added 2189 to 4988, And the whole fumme appearethin be 7177.

Proof of Addition by Subtration,

Bhors.

19:30



Dow to try whether that fumme bee! added or no. I will subtract one of the field fummes from the chird. And if I have h bone, the remainer will bee like that of femme : as for example, I will subtrace fire fumme from the third, which I fett th older. (ee, to uce 8746, which was

therefore I take up 5000 : and feeing that is too much by 4920, 3 fet down fo many in the fecond roome, which with the 70 being there already, doe make 4990, and then the fummer do fand thus.

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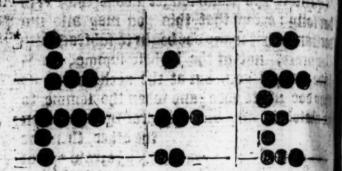
Det remaineth therein the first fumme to be abated from the fecond fumme when that place of unites both appear onely 7: (mut I abate a higher fumme, that is to 10, but feeing that 10 is more then 9 (th I (bould abate) by 1, the fore thall I take up Counter from the fecon and let down the lame the first line, or lowermo line, as you fee here. And so bave 3 en this work, and the fun appeareth to bee the fa which mas the fecond fu nain f of mine Addition, and therefore I perceive bave well bone. Master

Mafter. To fand longer about this, it is Another but folly : except that this you map also un way of berfand, that many doe begin to fubtract with Addition, Counters, not at the highest summe, as 3 have taught you, but at the nethermost, as the doe afe to adde; and when the fumme to mabated in any line appeareth greater then

> the other, then boe they borrow out of the nert higher roome, as for example,

I theolo abate 1846 from 2378. Thep let the fame of the thus: los gmolor a

First thep take 6 which is the lower line, and his space from 8 in the fame roomes in the fecond fumme, and et there remaineth two Counters in the lowest line. Then in the second line must 4 be subtracted from 7, and so remaineth there 3. Then 800 in the third line, and his space, from good the fecond fumme cannot be, therefore to they abate it from a higher roome, that is, from 1000, and because 1000 is too much by 100, therefore must I set down 200 in the hid line after I have taken up 1000 from the fourth line. Then is there yet 1000 in the burth line of the first summe, which it 3 withain from the second sum, then do all figures hand in order, thus: 532.



So that (as you fee) it differeth not great lp whether pon begin Subtraction at the higher lines, or at the lower.

Bowbeit as fome men like that one bu beft fo fame like the other: therefore pour not knowing both, may ale which you lift.

contract bear a nell the same and all and

Word and and and think sell also sell trainmelia delegant a manda de constitución del foc

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Multiplication.

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Vt now touching Multiplication:
you shall set your numbers into
two roomes (as you did in those
other kindes) but so that the multiplier bee set in the first roome:

then shall you begin with the highest numbers of the second roome, and multiply them first af-

terthis fort.

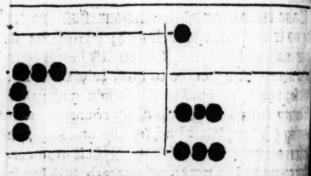
Take the overmett line in your first work. ing as it were the lowelt line; fetting on it fome moveable marke (as you lift) and looke bowmany Counters be in bim, take them up, and them fet downe the whole multiplier fommy times as you tooke up counters : rec: honing (3 fay) that line for the unites. And hen you have done with the highest number, tencome to the next line beneath, and doe fo per with it, and so with the next, till you have me alt. And if there be any number in a space mio; it chall pou take the multiplier five ines, and then must you reckon that line for minices, which is next beneath that space. delle after a thorter wap, pe thall take onely the multiplier, but then thall you take line next above the space so; the line of nes. But in each working, it by chance multiplier bee an odde number, to that famot take the halfe of it justly, then mult

must you take the greater halfe, and let down that, as it that it were the just halfe: and fur ther, you shall let one counter in the space be tweene that line, which you reckon so; the line of unites; o; else onely remove so; ward the same that is to be multiplied

Scholar. If poulet forth an example bere

of, I think I Mall perceive you.

Master. Take this example: I would mitiply 1542 by 365, therefore I set my numbers thus,



Then first I begin at the 1000 in thehich roome, as if it were the first place, and take it up, setting bown for it so often (his once) the mulciplier, which is 365, has you see here: where, so, the one Countaken up from the south line, I have set mother size which make the summe of the man plier, reckening the fourth line, as if it the first, which thing I have marked by starre set at the beginning.

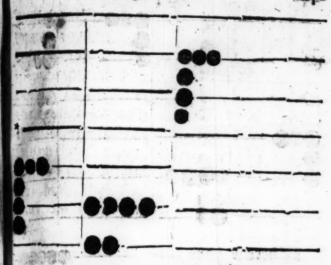
Schol

lama lo mi 365. Ma

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Scholar. I perceive well, for indeed this famue that you let down, is 365000: for 10 much both amount of 1000, multiplyed by 365.

Malter Whell then go forth, in the next pace I finde one Counter, which I remove owner, but (as in such a sold I must) set downe the greater halfs of multiplyer (seeing it is an odde number) with is 182, and here I doe still let that burth place stand as if it were the first, as in tele examples you shall see.

Tal bere

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Another Powbeit another forme of come to multiply Multipli-Counters in ipace, is this: firft to remote the finger to thenert line beneath the pace, and then to the up the Counter, mo to let downe be Multiplier five times, as here you Which fummes if w boe abde toge. er into one fumme, chall perceibe that it will bee the ame that appeareth the other working doze, to that both steare to one innt: but as the other horter, so this is lainer to reason, foz ut as have had mall exercise in this Patwith Canding map adde them pour minue befoze net them downe: as in this example you

might have faid, five times 300 is 1500, and five times 60 is 300, also five times in is 25, which all put together, do make 1811 which you may at one time set dotone is lift.

But now to go forth, I must remove hand to the next counters which are intered and line, and there must I take more foure counters, letting betwee for the multiplier foure times severally, or else agather the whole summe in my minde site then set it bottome: as to say, four times is 1200: foure times 60 are 240: and so times 5 make 20, that is in all 1460 that I I set bottome also, as here you see.

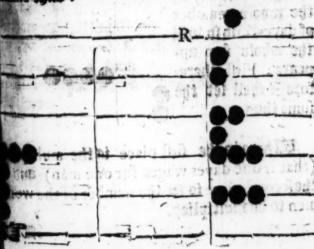


Tabich if I joyne in one fumme to to former numbers, it will appear thus.

A Can michigan in

Then to end this Multiplication. 3 remone

then to end this Multiplication, I remove thinger to the lowest line, where are onely am do I take up, and in their stead doe in the downs twice 365, that is 730, so; which I lit one in the space above the third line for 300, and 2 more in the third line with that m that is there already, and the rest in their other, and so have I well ended the substitutes:



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number of years fince Christ his Incarnation being multiplied by 365, (which is the number of the dayes in one year) both amount h 562830, which declareth the number of daye fince Christs Incarnation, unto the end of 1541 years, beside 385 dayes, and twelve houres for leape year.

Example of wages.

Scholar. Pow will I prove by anotherample, as this: 40 Labourers (after 6 poethe day for each man) have wrought 28 days. I would know what their wages both amounts.

An this cale must I worke bombly. Finds
must multiply the number of the Labourer,
the wages of a man for one day, so will

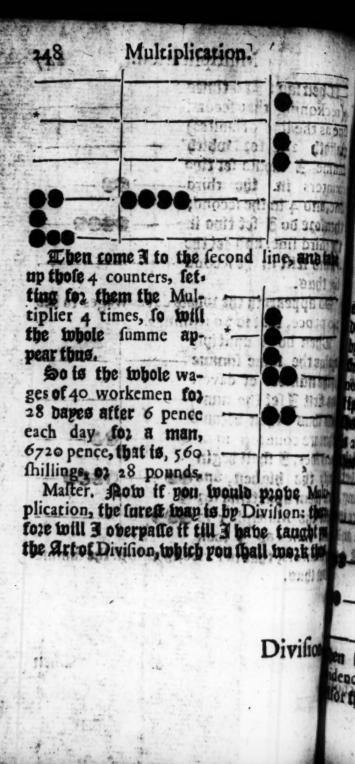
charge of every day amount.

Chall I multiply the charge of one day by the whole number of dayes, and so will the whole sum appears: First there fore I shall set the sums thus.

(that is one dayes wages for one man) and the fecond place is let the number of the word men to be multiplied,

Multiplication.	247
(reckoning that second————————————————————————————————————	
fumme 3 Chould fet two counters in the third— like, and 4 in the second, therefore do 3 fet two in———	**************************************
ine third line, and let the stand till in the second————————————————————————————————————	wages to bee
240 pence, that is 20 shillings. Then do I multiply againsthe same summe by the number of dayes, and first I set the num-	the fabric . pentional . pentional
ters thus: then because the tere are counters in di- en lines, I shall begin the bighest, and the bighest, and the bighest the	o nagua ati Con de de con Con los con
the them up, setting so 2 0 cm the Multiplier so 000	to a film 3 or
mo thus.	
podiviCl &	Then

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then fan Thurst tunes a greek hight if I tale

Irft, set down the Divisor, for feare of forgetting, and then fet that number that shall be divided at the right side, so farre from the Divisor, that the quotient may

le set between them: as for example.

Hezz fheep coft 45 pound, what bid the the whole summe, that is 45 pound, sheep. par, but that cannot be: therefore must 3 a course that 45 pound, into a letter Deommetion, as terto Thillings, their 3 mulby 14 by 20, and it is 900 : that famme M3 Wide by the number of theep, which 125, thefe two numbers therefore 3 fet

100 en begin 3 at the highest line of the dend, and feek boto off I may babe the or therein, and that I may doe four times:

then fay 3, four times 2 are 8, which if 3 talk from 9, there refleth but 1, thus:

And because I found the Divisor 4 times the dividend, I have set, as you see, 4 in middle roome, which is the place of the que tient: but now must I take the rest of the visor as often out of the remainer: therein come I to the second line of the divisor, says two times 4 make 8, take 8 from 10, and fin remaineth 2, thus:

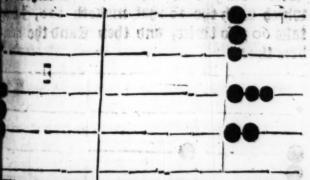
Then come I to the lowest number, it is 5, and multiply it 4 times, so is it 20, it take I from 20, and there remaineth nothing that I see my quotient to be 4, which mis balue shillings, so to was the dividend: thereby I know that if 225 sheepe cold pound, every sheep cold 4 shillings.

Scho



Scholar. This can 3 do, as you thall per Example also by this example. If 160 Souldiers doe of fouldiund every moneth 68 pound, tohat fpend, ers wages, theach man ?

first, betaufe I cannot divide the 68 bp 160, therefore I will turn the pounds into maty Multiplication, fo that there be 16220 e: now mult I divide the fumme by the ber of Souldiers, therefore 3 fet them in



ben begin 3 at the highest place of the diend, seeking my Division there, which I once therefore I fet i in the nether line. Master. \$ 3

Master. Bot in the nether line of the whole summe, but in the nether line of that make which is the third line.

Scholar. So fandeth it with reason. Mafter. Then thus do they fand.



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may finde my divisor: and see that in 30 might finde 100 three times: but them 60 will not be so often found in 20, them I take 2 for my quotient: then take \$100 twice from 300 and there resteth 100, and twhich with the 20 that maketh 120, 3 my take 60 also twice, and then stand the numbers thus:

There I have let the quotient a in the lowelt old in every Souldiers postion dos pence, 1 16 8 faillings 6 pence and alth ni rolive

tiflere But get because bon hap fuffly mbethe realant of Division, it will be good you fet sonp divisor till andire thole bers from which you to take it as bother and further 3 let top larged that Bestmin

If the purchase of 200 acres of ground did coft 260 pound, what did one acre coft ?

first, will turn the pounds into pence, so An examthe to 89600 pence. Then in letting chafe. win thefe numbers, 3 thall doe thus:

First fet the dividend on the right band as thought, and then the divisor on the left hand mint those Rumbers from which I interio to take bim first, as bere pou fee, where 3 babe lettle divisor two lines bigher then his owne

ple of pur-

ciaten trous pe number againt it, follo	- 000
	7
Mile foor to per any i remaining	4
Scholar. I. lehat if it chance that win	
to Die Die Personal is early he beent	
then out of the dividend and in the	
Maffer and the Drive before	
office line lower.	
Scholar foot waste by Divine - by the pent	
no then lose of an tiese a cyphol let in the	6

Scholar. This is like the order of division the Pen.

Mafter, Truth pou fap, and now must 3 \$ 4 fet

fet the quotient of this mork in the third line for that is the line of unites in respect of the Divisor in this work.

Then I fee how often the Divisor maybe found in the dividend, and that I find 3 rime then let I 3 in the third line for the quotient and take away that seems from the Dividend, and further I set the Divisor one line low, as you see here, and could be a seem and see here, and could be a seem and see here.



And then feek 3 how often the Divisor be taken from the number against it, with will be four times and i remaining.

Scholar. But what if it chance that win the Divilor is so removed, it cannot be mu taken out of the dividend against it?

- Int

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Mafter. Eten must the Divisor be fet fi

nother line lower.

Scholar. So was it in Division by the parano therefore was there a cypher set in a quotient: but how thall that be noted bear Master. Here needeth no token, for the lines do represent the places, onely looked you set your quotient in that place which the

now to returne to the example: I finde the divident four times to the example: I finde the dividend and remaining: for 4 times 2 make 8, which I take from the most and there resteth r, as this figure following sheweth: and in the middle space for the quorient; I set 4 in the second line, which is in this work the place of unitessal.

to repeat and the endired which indicate in the continued of the continued

Then remove I the Divisor to the next lowcrine, and seek how often I may have it in the dividend, which I may bo here 8 cimes just, and nothing remain, as in this forme.

Der reine porting on the colored of the colored of

348 pence, that is 29 shillings, whereby ?

know that to much com the purchase of the Acced to a E tale para act of sentist of clar

Scholar Boin refleth the proofs of mili plicacon, and also division agents a. 161 1 mile

Mafter. Affeir bell proofe are each one b the other : for mulciplication is probed by di vision, and division by multiplication; as with work by the pen ponlearneshit it out and mit

Scholar If that beall, pon thall not me to repeat again that which was fufficient taught already: and except pou will tenth any other feat, bere may you make an end of

this Art, I suppose.

The reafon of all the former rules.

Mafter. So will 3 doe as touching while number and as for broken number 3 will me trouble your wit with it, til you have madle this fo well, that you be full perfect, fo that m need not to boubt in any point that 3 bis taught you, and then may 3 boldly infini you in the Art of fractions on broken number wherein I will also thew you the reasons all that you have now tearned. Wut pet belo 3 make an end, 3 will thew you the order common cafting, wherein are both pence, fill lings and pounds, proceeding by no ground reason, but onety by a cece thed form, and divertly, of divers men, for the Merchantsh one form, and Auditors another.

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Merchants use.

By first for Merchants form, mark this example here, in which I have expressed this sum 198 pounds, to shillings II pence. So that you may see that the lowest line several for pence, the next alove for shillings, the third for pounds, and the fourth for sores of paunds.



Merchants'
Accompt,

And further you may fee that the space be then pence and shillings, may receive but one counter, (as all other spaces tikewise doe) and that one standeth in that place so, 6 pence.

Likewise betweene the shillings and the pounds one counter standeth for to shillings.

And between the pounds and 20 pounds,

counter fandeth for 10 pounds.

But befide those, you may see at the test side whillings, that one number Canbeth alone

beforeneth 5 shiftings.

tandeth for 5 pounds, that one counter tandeth for 5 pounds. And against the 20 pounds, the one counter standeth for five score pounds, that is 100 pounds: so that every side counter is five times so much as one of them assims which he standeth.

Auditors

Auditors Accompt.

Auditors' Accompt.

On for the Accompt of Anditors, takethe



198 pound—19 shillings—11 pence.

But here you fee the pence stand toward the right hand, and the other increasing order

ip towards the left hand.

Againe you may fee, that Anditors will make two lines (yea and moze) for pear shillings, and all other values, if their summertend thereto. Also you see that they seem Counter at the right end of each row, with so set there, standeth for sive of that room, and on the lest corner of the row, it standeth for of the same row.

and

But now if you would able of subtract to ter any of both these sorts, if you mark then ber of the other seat which I taught you, pumay easily doe the same here without must teaching: sor in Addition you must first to botton one summe, and to the same set the other orderly, and in like manner, if you have my; but in Subtraction, you must set down first

the greatest somme, and from it must you abate the other, every Denomination from his due place.

Scholar. I do not doubt but with a little partie I wall attain these both: but boto shall and bivide after these forms.

Malter. You cannot duely do any of both by thele losts, therefore in such case you must refort to pour other Arts.

Scholar. They that ale lach Accounts that it exceed 200 in the summe, they set not 5 at the less hand of the scores of pounds, but they set all the hundreds in another farther row, and soont the less hand thereof, and the chousands they set in a farther row yet, and at the less side thereof they set the 5000, and in the space over the set the 10000, and in a higher row 20000, which all 3 have expressed in this example, which is 97869 pounds, 12 shillings, 9 pence, the Ninety seven thousand, eight hundred threscore and nine pounds, twelve shillings and nine pence half peny farthing, for 3 had

Touch in this thing you must take the in the Country of the last of the country o

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edadi çor degi çine en yandegi i açi çol aci çunt. Ora ericile esineda i adad nam Takhar Adat. Auditors Accompr. A

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neither bow you thouto
fet downe farthings
which (as you fee bere)
must bee fet in a boide
place fibeling beneath the
pence, for a farthing, one
counter ob, a counters,
for ob, farthing 3 counters, and more there cannot bee a for 4 farthings
make a peny, which must
be fet in his one place.

And if you delies the fame fumine after Auditors manner, to here it

te.

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But in this thing you thall take this fufficient, and the rest you thall observe as may see by the working of each sort, for the bers wits of men have invented divers a sundry wayes, almost innumerable.

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IRITHMETICK,

wuching Fractions, brief-

te filing direct to begin with the explica-

Scholar. Scholar.

Lhait I perceive your manifuld businesses dath so occupie, or rathen appresse you, that you cannot as yet compleatly end the Treatise of ticall sta-Fractions in Arithmeticall, ctions.

the of Geometry, Musick, and Astronomy be:

natural works, touching mixtures of Metali and compositions of Medicines, with other fra examples. Tet in the mean feafon. IT cannot be my most earnest desire, but importunely cre of you some briefe preparation toward the me Fractions, whereby at the least I may be able feetly to understand the common workes of the and the vulgar use of those rules, which Withme them cannot well be wronght.

Mafter. If my leafure were as great as will is good, you should not need to use importanate traving, to: the attaining of he thing, whereby I may be persuaded that I thall any mayes profit the Common-west or help the bonest studies of any good Menbers in the same : wherefore while minut tendance will permit me to walk and talk ! am well willing to belp you as 3 may.

Therefore, first to begin with the expline tion of this name Fraction, what take put

to be?

What a

Scholar. Marry fir, 3 think a Fraction in Fraction is 3 have beard it often named) to be a broke number, that is to fap, to be no whole number but part of a number.

> Mafter. A Fraction indeed is a broken a ber, and to confequently the part of anot number : but that muft be unberftood of another number as cannot be bibibed into other parts then Fractions : for although! map take the third part of 60, or the found

part of it, and so of other parts diversig, pet bele parts be not properly nor ought not to be en Fractions, because they may be expressed whole numbers, for the third part of it is 20, the boarth part to 15. the twelfth part to t. mio forth of other parts, all tubich be whole mbers.

Therefore properly a Fraction expressed What a Me pirts 02 part onely of a unite; that is to Fractionis in that the number which is the tobole of properly. alto fumme of any Fraction, may not bee to one Fraction alone can bee so great, that make 1 : as by example 3 will beder, as foon as 3 have taught you to know he forme bow a fraction is expressed or repres fented in waiting.

ili priita san inot surfisi

Numeration.

The ex-

Vt first to begin with expression a Fraction, which is the number tion of it: you must understand a fraction is represented by the numbers set one over the above

and a line drawne between them, as thu, † † which four fractions you must pronounce ; one third part, † three quarters, † two

parts, is ten seventeen parts.

Scholar. I understand this forme of the expression and pronunciation, but their ming or valuation seemeth more obscure. I think that by the two sirst fractions in derstand the valuation of the two latters ons, and consequently of other.

Mafter. Malue them then, that 3 mans

ceive your taking of them.

Scholar. \$ betokeneth two fift parts, the to lay, if one be divided into 5 parts, that is on doth expecte two of those 5 parts: \$\frac{1}{2}\$ fignifie, that if one be divided into 17 parts take ten of thom. And this \$\frac{3}{2}\$ gath the two first examples: \$\frac{1}{2}\$, that is, one part, doth easily declare, that if one thin divided in to three parts, \$\frac{3}{2}\$ must take out of them: \$\frac{1}{2}\$, that is three quarters, declare that one being divided into four ters, \$\frac{3}{2}\$ must take (for this Fraction)

ofe quarters.

of there be no more difficulty in their Nuention, then I map pou go forward to their tion and Subtraction, and fo to the other To of works. For I understand that the hindes of works be in fractions, that bee whole numbers.

2

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Mafter. There are the fame kindes of mka in both; albeit the order of them is bimeration before we leave it. You mus unand, that those two numbers which ers Numeraes Fraction, babe feberall names, the or tor. mot, tobich is above the line, is called the Denomimerator, and the other beneath the line, is nator. othe Denominator.

kholar. And what is the reason of their diennames? For (in mine opinion) both bee omerators, feeting both thep doe expresse the regation of the Fraction.

Malter. Pon are Deceibed; for one onely hich is the overmost) doth expresse the meration, and the Denominator Doth Dethe number of parts, into which the unite tibed, as in this example; when 3 fag: a pound weight of Gold between foure to that the first man thall babe ; the fethe third + , and the fourth ...

tor (which is one in all foure fractions) intended that the pound weight thould hose tate to many parts, I means 15.

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and by the foure severall Numerators, is limited the divers portion that each manshow have, that is that when the whole is part into 15, the first man shall have two of the 15 parts: the second man three of them: It third man foure: and the fourth man six. In so may you see the severall offices (as it bere of those two numbers, I meane of the Nat. rator and the Denominator.

And hereby you perceive that a man in have no more parts of any thing, then it is divided into, neither yet aptly so many: so it were unaptly said: You hall have the is 15, fifteen parts of any thing, seeing it is better said, you shall have the whole thing.

Scholar. So both it appears reasonably the labour is vaine to divide any thing, we then to apply the division to no use. And mileste reasonable were it to say is for the whole be divided in 15 parts onely, it is possible to take 16 of them, that is to say then all together.

Master. This is true touching the put and apt use of the name of a fraction; improperly (and after a vulgar acceptation easinesse in work) both those forms called fractions, because they be written fractions, although they be none in deed in and generally in such other, when numerator and denominator bee equally not fractions, but the whole thing with his parts. And so the interpretation is not to be called a second and so the second in the called a second in the second in

F

tion but a mirt number, of a whole number Animprono a fraction, for it is as r'i , that is one per fradiblok and x parts, as Chall be declared in mixt num-Reduction. Therefore thep doe abufe the ber. name that call them fractions, where the numerstor is either equall, or greater then the demominator.

Scholar. But is there any needfull caufe, the thep thould fo abufe the name ?

Mafter. A bere is cause who they thall foundames for eatinette in toorke write forme numbers after that fort like fractions : but to be twhole numbers, or mirt numbers, (hat is, tobole numbers with fractions)ermeded like fractions, 02 as improper fractions.

Sow mult you understand, that as no nation properly can be greater then one, fo i smallness under one the nature of fractiwooth extend infinitely, as the nature of nitely, so that not onely one may be divi-a into instnite fractions of parts, but also ni a into infinite fractions of parts, but also tall any fraction may be divided into infinite ctions 02 parts, which commonly be called ctions of fractions: and they be expressed Fractions and : as for example, 3 of 3 of 1, that of fractithree quarters, of two third parts, of one le part. Whereby is signifyed, that if bee divided into two halfes, and the halfe into three parts, and two of those

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three parts be divided joyntly into foure que, ters, this fraction of fractions both represent

three of those quarters,

this note I give you by the way, this forme of expressing those fractions is below ry, and bath no other reason then the will the Divisor, which some many follow: a some expresse them thus, \frac{1}{2} \frac{1}{2} without figure of distinction between them, but some also many follow. Some other beat sines betweene every fraction, and adde with of distinction, after this sort, \frac{1}{2} of \f

Some other expecte them
thus, in slope form, to distinct
them from fractions of one
whole numbers, for if they
were set in one right line thus,
ought it to be pronounced, three quant
and two third parcs, and a halfe, which ma
almost two whole unites, lacking but
twelfth part. And so is it nothing agree

with the other fraction of fractionst wherefor the a great overlight in certaine learned men which do expecte them to confusedly with such fengall fractions, that a man cannot know me from the other.

Therefore some men (as Stifelius) do expresse shout a line, numbers of proportion, being applidio Addition, or Subtraction, because they malle taken as two, where the line in fractions makeshthem to be taken for one : For of the Numentor and Denominator is made one number.

Scholar. Then I perceive there bee three Three fement fraction to let to one number as that ricties. foure fifth parts. The fecond is, when there le let tipo or more leverall fractions of one mober, as ; , , that (s, foure ninth parts, and frections, as 2, of 2, that is, foure ninth parts ftwo fifth parts.

Milter. Don babe laid well, if pou under-

fand well pour own words.

en I 4

Scholar. If it that please you, I wil by an eximple in the parts of an old English Angel, ere note my meaning.

Mafter. Let me beare pou.

Scholar. The old English Angel Did comthe 7 shillings 6 pence, that is 90 pence on; of it is 72 pence: And of the same 90 ence, if I take ; and ; that is, foure ninch nes, and two fifth parts, 1840, and 18 36 hich both make 76: but it I take 101, that T 4

Numeration of Fractions.

ts foure nine parts of two fifth parts, see it is but 36, then \$ of 36, will peeld but 16, of 36 is but 4, and that taken foure time maketh 16.

Master. This is plainly expected, and in ly, and hereby (I doubt not) but you doe preceive, that as great a difference as is better 16 and 76, so much difference is better those two fractions 2 and 2: and 3 of 3.

And now that you understand these in rieties, I will proceed to the rest of a morks: First, admonishing you, that had is another order to bee followed in fractions then there was in whole numbers: some whole numbers, this was the order: Numeration, Addition, Subtraction, Multiplication, Division, and Reduction: but in fractions, so sold the same apinesse in proceeding the this order of works, Numeration, Reduction, Addition, Subtraction, Multiplication, and Division.

The order of works in fracti-

Scholar. That Addition and Subtraction thould goe together, and Division to follow Multiplication, naturall order both persual but to Reduction should be first in our here, next to Numeration and Addition, a Subtraction in the middle, I desire to undurant the reason.

F

Master. As in the Art of whole number Deder would reasonably begin with the estell, and so goe sociward by degrees to the

hards

bardest: sven reason teacheth in Fraction the like order. And consider that Addition or Submiction of Fractions, can very selection bee mought without Reduction: and contraction Reduction may be wrought without this can of Addition or Subtraction: therefore to the orderly required, that Reduction should me before Addition and Subtraction, and this major serveth for the placing of Reduction before the other.

Scholar. Then, if Reduction be the easiet, 1 pap you declare the forme of it, first by rule,

anthen by example,

ot,

ber

Miller. Dour requeft is good.

Redu-

Reduction of Fractions.

Ofreduction of Fractions, there are five variesics.



Herefore will I now declare the diversities of reduction of fractions, which commonly hath fur varieties, or formes.

First, when there beefer

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dry fractions of one intire unite, they must benduced to one denomination, and also into one faction.

Secondly, when there be proposed fraction of fractions, they must be reduced likewise into me fraction: for otherwise they cannot be brought

into one denomination.

Thirdly, when an improper fraction is proposed, that is to say, a fraction in form, which intelliged is greater then an unite: it must be reduced in apt form, expressing the unite or unites of it, and the proper fraction distinctly. And sometimes of it shall be needfull to convert such a mixt number of unites with fractions, into the form of a fraction, that is, into an improper fraction: which the forms I esteem but as one, because they work whind of number.

Fourthly, there happeneth sometimes fraction to be written in great numbers, which might written in lesser numbers, therefore uthous mean to reduce such great numbers into the

smallest termes.

Fifthly, when any fraction betokeneth the parties of a whole thing, which hath by common parties

certaine parts, but none of like denomination with that fraction, then may you reduce the faid fractiens into another, whose denomination shall exwife the common parts of that whole thing.

cholar. This villinaton in Doctrine Doeth me much, but more with bove then meent fruit : fo) as pet I doe not understand fariely the varieties, and much leffe the pia-

dife and use of their morks.

Time Is he

Mafter, Reduction is an oberly alteration of Numbers out of one forme into another, with is never done apperly but for forme needfull ule, as in every of the fato five feverall

formes, I will dictinate beclare.

First therefore, when two, or more severall The first fractions of any unite be proponed: as for ex- form of: ample to and &, because it is hard to tell Reduction whit proportion of the intire number those two fractions doe expresse, therefore was Reduction devised, to be a mean whereby these feverall fractions might be brought into one denomination and fraction.

and in these fractions, this is the Art for

blinging them to one denomination.

Multiply first the denominators together, and Howto the totall thereof you shall fet twice down under reduce fratwo severall lines for two new denominators, or divers derather for one common denominator. Then multi- n minati-Ny the numerator of the first fraction, by the de- ons into minator of the second, and set the totall thereof one denothe Namerator over the first line. Likewise tiply the Numerator of the second frattion

ctions of

by the denominator of the first, and set that total over the second line for the Numerator of the fraction: & so are these two first fractions of severall denominations, brought to one denomination.

Scholar. If I understand you, as I thin I doe, my Example thall declare the same. The Fractions which you proponed were these, it and it, whose Denominators (bing 16 and 6) I multiply together, and there mounteth 96, which I set under two line, thus: 100 Jan.

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Then I multiply the Numerator of the find fraction by the Denominator of the second, saying, 3 into 6 maketh 18, that I set our the first line so, a new Numerator, and it will

be thus: 15.

Likewise I multiply the Numerator of the second fraction, by the Denominator of the first, saying, 4 times 16 maketh 64, that In so, the second Numerator, and the fraction will appear thus, 2.

So that both fractions brought to one dem-

mination, must fand thus, 3 and 3.

Mafter. you have done well.

Scholar. I befeech you let me examine it is ter my accustomed forme, by common parts of copie or other measure.

Mafter. Bo to.

Scholar. I have a peece of Gold which accounted worth 8 shillings, and contained 96 pence, whereof is, that is, the street part is 6 pence, and is is 18 pence, the

Againe tof the same peece of gold is 16 pence, fo that & parts maketh 64 pence, that is and fo 3 finde the fummes to agree with the other before.

after. So have you now the Art to bring Note the much fractions into one denomination : And Reduction fibere be more then two, then must you mul- of three my all the Denominators together, and set the fractions. total thereof so many times down as there bee into one. frations; and then to get for each one a new Numerator, multiply the Numerator of the first, by the Denominator of the second, and the totall thereof multiply by the Denominator of the third, and so forth, if there be more. Likewife multiply the Numerator of the second, h the Denominator of the first, and the totall thereof by the Denominator of the third. And is the same fort multiply the Numerator of the third into the Denominator of the first, and the totall thereof into the Denominator of the second, and so forth if there were moe. So these three Fractions ; 3 do make by Reduction these other three fractions of denomination 14 45 8. All which you may bring into one Fraction by ding the Numerators together, and putting the totall for the totall Numerator reserving still that same common Denominator. And those three Fractions make one improper Fraction, thus:

00

Scholar. All this I perceive, and also that late Fraction to moze then an unite, and perefore you old call it an improper fraction. Master.

Master. There be certaine other somes of working in this Reduction, which I will briefly touch also, to give you an occasion to a ercise your wit therein.

The first variety of Reduction

The first variety is this? When you have made and written down your common denominator (as I have taught before) then to get a numerator for the first, do thus: Divide the common denominator by the denominator of the first fraction, and the quotient multiplied by the numerator of the sun, yeeldeth a new numerator for the first new superition. So likewise do with the second, and the third, and with all the residue, if there be more.

Scholar. That will I prove in your later ample of these three fractions, \$\frac{1}{3}\$. We hen the denominators her multiplied, they make 60 for 5 into 4 maketh 20, and 20 by 3 yeelest 60, that I set down three times thus: \(\frac{1}{3}\), with then to bake a numerator, sor the first, I me divide 60 by 5 (the denominator of the side and the quotient is 12, which I must multiply by 2 (the numerator first) and that maketh 24 and so bake I sor the first fraction, \(\frac{1}{3}\).

Likewise so, the second fraction: A dishe so by 4, and there commeth 15, which I multiply by 3, and so babe 345, so, the second fraction 23. Then so, the chird in like so, t will

come 45.

The fecond variety. Master. Another way is this: If it happen so, that the lesser denominator, can by any multiplication make the greater, then note the multiplier. & by multiply the numerator over that lesser denominations.

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for the leffer denominator put the greater, what in the fe two fractions is and to three being beleffer denominator multiplied by 4, will make 12, which is the greater denominator: therefore by the fone 4 I do multiply 2, which is the numeraunner 3, and that maketh 8: under which I do puts, being the greater denominator, which is femade by multiplication of 4 into 3, and so see I these two fractions 13, 13, thus shortly rehand without altering the one fraction.

Scholar, This I understand.

Master. Then mark this third way: If the de- The third uninators do not happen so, that one by multipli- variety. cuien may make the other, then look whether they but may be parts of any other one number, as in in and is, although the lesser taken but twice, be to much to make 18, yet they both may bee parts unto 36, therefore look how many times twelve is in 36,6 that quotient being multiplied by the numerator over 12, the totall shall be put in stead of the Numerator over 12, and for 5 put 15, thus and likewise look how often is 18 in 36, because il utwice, therefore by 2 multiply 7, which is over 18, and it will be 14: fet that for the Numerator, andip stead of 18 put 36; and then your fractions reduced stand thus, is it stead of is, and it.

and if you will prove whether you have proofe. mought well or no, that may be proved by eduction of them agains to their former denominations, which Art thall bee taught in touth kinde of Reduction, tohere greater times of Fractions be reduced into smaller in

tor,

Rumber

number, but no smaller in proportion, and if in fuch Reduction the fame termes 02 num bers come againe that were before, then is worke good, elfe not.

Scholar, Sir, 3 beare pour wezos, but doc not understand many of them: which if

please pou, beclare.

Mafter. With a good will, when convening place ferbeth, but that must bee in the fourth kinde of Reduction, which teach bow to reduce fractions of fractions into fraction, and to to one denomination.

The fecond forme of Reduction of fractions of fractions into one fraction and Denomination.

When fractions of fractions be proponed, in Shull multiply the numerators of each into other, and set the totall for the new numerator, and the multiply all the denominators likewise, and take their totall for the new denominator, and four they speedily reduced.

Scholar, If that be all, then I under and it already, as by this example I will becin. These bee the fractions, & of of of of which I would reduce to one denomination, and me

per simple fraction.

Therefore begin 3 with the Numeraton and multiply them together, faging, 3 maketh 6 : and 6 by 6, maketh 36, which tiplied by 7, peeloeth 252: that I set over a line for the Numerator, thus:

Then I multiply the Denominator, 3 maketh 12, and that by 7 bringeth which multiplied by 9, reeldeth 756,

Denominator, And to the stand out same reduced fraction to this, with 1 252 is too bard a fraction for a 756 ander Gand pet. mex aid

- Junito

-Maritime

duction

to Don think fo, and no marbell, but on thall learne to judge theafilp, for this a is no more indeed then ; , although in greater termes, and therefore more and more obscure.

this lufficeth for this Reduction, fabe built thew you by a figure of measure trate and reason of this kinde of fraction, and also the due understanding of their Bee now is is eine that wer con aginal

forms of Reduction, reliefs touchast of inter The entire measure parted into 9.

and fractions although they sprear the full 1 2 3 4 5 6 7 18 9 10 3 4 5 6 7 3 3 4 7 . Tiel doson E . 73 ario & to signife, their (fifty blos

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you fee the longest measure, (which to for the whole and entire quantity) arted into p divisions, whereof 7 are feby the second measure and thereof a are parted out 6, and that 6 being bi into three parts, tipo of them are parted fourth measure, of which fourth measing divided into four parts, the lowelt

meafure

measure both containe t, so that the land must bee named work of the topole mone but indeed is tolly of the topole mone

Scholar. This example it to tentime it a taking the four for the factor is a thing that the factor is a think the factor is a think the factor is a think the factor in a fact

mot doubting but pou will gather greater of knowledge hereby, a and seld oils out an

The third forme of Reduction of improper fractions. But now it is time that wee come to the forme of Reduction, which teacheth of improper fractions, that is to fay, mixt numbers of mu and fractions although they appear like full ons, as this is, which doth conclude it is wholly, and is over. Wherefore first you know them, by that the numerator is greatent the denominator.

Scholar. Indeed Sir, that appeareth nable, that if the Numerator do expedie parts to be taken of any unite, then the Dinator doth agnific that white two into, it must needs follows that huse all importeth more than the topole, that is the whole with certains parts over that Reduction is there in it?

Two feverall waies in this Reduction. Master. There be two Teverall Minds Reduction, concerning such fractions

The fifth

medit shall bee needfull to convert these Mons into unites, and the proper Fraction. will remaine. And fometimes contrarithall bee meet to reduce mixt numbers, My Lunites written with Fractions, into the for of one simple Fraction, and so be there

olar. Wahat is the mean of the first way ten improper fractions into unites with

belt proper fractions Mater. Thut is thut; Your Numerator be- way. in mater then the denominator, must be divided Redu by the same denominator, and the quotient thereof ction of amfeth the mites : the remainer shall bee put improforthe Numerator of the fraction that resteth, per fiactimatthe Denominator must bee the same that was

Scholar. For example, 3 take ';, and Dibi- proper fra-117 by 5, the quotient will be 3, and there clions. temaine 2,

Miller, That you must write thus, 3, 7, (pon fee) I have written 3 without ang as entire numbers ought to bee witten. the that remained. I have fet over the Denominator, with a line, as a proper ion and this number both fignifie note soultes, and; of one.

holen Aben if I would by unites here erand Crownes, to it were 3 Crownes, that is a B.

Mer Bren fo, and therefore ? did figethe same : But this happeneth sometimes that when the Reduction is fo wrought, the remaineth nothing : And then it is not a number, but a simple intire number, rebrefe ted like a fraction.

The fecond way.

Scholar. As 4 will make a tuft and 4 make even 6. This 3 will remember now, what is the fecond forme of Redu that pon fpeake of to; thele forts of frach

Reduction of whole numbers lone, or joyned with fraimproper fractions.

Malter. When for ver you have any of thefe forts of numbers, that isto fay, whole num without fractions, or whale numbers with fre either 34 ons, and you would turne them into the forme a fraction, you must multiply the whole number that denominator which you will have to rea Ctions into fill, and to the totall thereof adde the Number tor, which you have already, and all that shall fet for the new Numerator, keeping still the mer Denominator : As if you have 6 3 wh would convert into an improper fraction on multiply 6 by 4, whereof commeth 24 and adde the numerator, which is 3, and fo have just for the numerator, & 4 ftil for the denomina

Scholar. Then is ? equall to 6412

Note.

Malter. C'ben full and fo backward appeareth by the former Reduction) 6 ketb 7. And thus one of their reduction be the proofe of the other worke.

Scholar. This I perceive : 1But not monto turn whole numbers without free into any fractions, I feenot bow that m bone because there is no denominator to the multiplication bp.

Master. That is well marked: but this you mow, that no man intendeth to turne any whole number into a fraction, but he hath in his winde that denominator by which the mulplication must be made: for the proofe moved I set down 7, which is a whole number. And if you will have this number anteried into any certain fraction, will mee to be it.

Scholar. I pray you reduce 7 into a Fra-

Maller. Then you care not what the Fra-

Scholar. Po, I palle not for the lost of the

Malter. Then how can you thinke that you make me to the any thing certaine, irbin pulsabe me to doe as I like And seeing you know at that skay, whether thinke you that I me ark intend in mind what Fraction I millimake of it before I can be it indeed.

Mnake of it before I can do it indeed.
Scholar. Else you hould do ignorantly.

Miner. Then will I limit my selfe (seeing will not) to turne it into quarters. And solve I multiply 7 by 4 (which is the demination by quarters) and there amounted so be set so, the numerator, and the 4 must set so, the denominator, and the Fraction set south.

Scholar. Indeed I perceive this to be reaable, for without much triall I understand it of any thing doth make 7. And so then

TT 3

ti 3 would turne 8 into 5 parts, it will be 5 which is all one with 8: for 8 Crowns ned into 5 parts, (that is, into willings) make 40 thillings, that is, 7 of a Crown.

The fourth forme of Reduction Malter. Seeing you understand now these the kindes of Reduction, I will declare unto your fourth kinde, that is, when fractions be written greater termes then they need, how they make brought to lesser terms.

Scholar. To write any thing in grain terms then needeth, seemeth to be a fault, of this Rule seemeth to amend that fault.

Mafter. It were a fault to boe ampt without need, which after muft be redie but in this case it is not so, neither bib ? absolutely (as you boe) that it needeth not h expresse those fractions in so great terms in that the fractions boe not need. I means their value, to be understood: but pet fti needfull for the cafe of thefe works to they be applied; as to example: In the kinde of Reduction this was your own ample, is and ?, which when you thou Duce, you were faine to turne them fire one denomination, and le appeared thep! and , where the fractions for their under Canding needed not to bee turned fmaller terms into greater, but pet the of working needed it.

Scholar. Sir, I understand note, not by the difference of this need (to; the mons might better be unterstood as from

feb m

in his value, when they were in elibough they could not so well ed) but also I understand what you erres of ipag in boubt : for I fee pon call fractions. imerator and Denominator, the terms of raction.

the I malad you underfrand it fo well: han then you would value any fractions (bewe they may best be done when the termes are elleft) you shall reduce them to the smallest that can, which thing you may do thus; Divide the test of any such two terms by the leser, and if thing raviain, by that remainer divide the last for; and if any thing remain now, by that dithe first divisor (which was before the rema of the last division) and so continue stil, til noto remain in the division: and then marke left divisor, for it is the number that wil easiway your fractions, if you divide both the num naor and the denominator by the same number for the number diand for the denominator his quotient, rifeth by his division.

sholar. I take toz erample 💥, and because the greatest number, 3 divide it bp 18, e quotient is 5, and there restet 6, what

I doe with this quotient?

falten Rothing in this worke, but now s there remaineth fomelubat, by that rener must pon bibide the last Divisor. scholar. 363 Chall divide 18, (which was

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the

the last Divisor) by 6, that was the remains to is the quotient 3, and nothing resteth. Master. As to: the Quotient, 3 omits

Master. As for the Quotient, I omits yet: but because there both comains notify therefore is 6 (which was your last Divide that number by which you may reduce a fraction proponed.

Scholar. Then as you taught mee, I had before the Rumerator 18 by 6; and the partent is 3, which I must put for the Pumerator over a line, thus:
And then by the faith 6 must I distinct will be 16, which I must take to be Denominator, and to be fraction; I had some thinketh this rule both prove the wond of the first Reduction.

Mafter. That is true, if the first Reducing there made of fractions into their least terms, and elie not, without some bely, as the land

humber in that place will beclare.

Scholar. The second number was 4, which was turned into \$\frac{2}{2}\$ by that Rule. Bow I shall by this Rule reduce it agains into a least terms, I must divide 96 by 64, and the remainsth 32, wherefore I must take this to; the Diviso2, to reduce the said Fraction Then do you divide 64 by 32, and the queent is 2, which I set for my Pameran Againe, I divide 96 by 32, and the quelle will be 3, and so I have but \$\frac{1}{2}\$.

Mafter. Pule not at the matter, fo!

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tone well enough : but pon think you e not the fraction that you looked for, that pet babe you one equal to it, as by the

holar. Eruth it is, for each of them will touth 8 pence, to that and and bee nee equal! And now I perceive that bewas not written in the least termes Munight bee, therefore this Reduction abt forth not it, but that other which to ten in the least termes. Row umberstand his Rule well. But is there any other way morks this Reduction?

Matten Yes, but first note this, that if you inde no fuch Divisor, to reduce the fraction til Another way to on come to 1, because one doth make no Di- work this vition, therefore that fraction is already in his Reduction less termes, as by 71. you may prove, and fo

and many other like. ? 10 %

But now for your better aid to find the due Note that proportion in least verms, with more cafe for a to mediate learner, you shal mediate or take the half any numof the numerator, and also of the denominator ber is to divide by clong as you may upon a line; alwaics parting two. am with a right down dash of your Pen as work, which may easily be done, if the numbers be even: as 2.468, or 1 o, but if they be od, though it be but i ne of them) then must you obreviate them by 3. 5.7, or 9, &co Gus.

And because examples do most infruct, 3 the here let downe the manner of two 03 thee, whose last number at the end of the line fhein.

moinets the least terms or valuation of the

As for example : I mould rather in the bis least terme or value, inherennen I fet for with a long line bearing from it, thus; 288 1 144 72 36 18 9 31 8 pull 576 288 144 73 86 18 6 3 3 culle And because both the Numerator, and the De nominator end in even numbers & for may be abbreviated bp 2.02 4.01 6.66 Th fore on the other Adopt the right polynem toward the right band; I first take the ba the Numerator : faging, the balf of 2 is 1; th balfe of 8 is 4: and again, the balf af 8 ma

therefore a part it with a right bowne w as before

Then boe 3 also take the halfe of 5764 faying, the balte of 5.10 2, and the belfeding is 8, and the balle of 16 is 8, and fo band 288 for a new Denominator de la contrata

which 144 is now ancip Numerator,

Then beginning againe; faping the balls 144 16 72, and the balle of 288 18 144 : 6 continuing the mediation of division by 2, till pou come to the last morke, as appears bere in the example, where the fame is rou

Southe fecond example 4 first abbrebia by 2, and againe by 2, and last by 7, is reduce to : which is equal to 23.

14 7 1 1112 56 184

Again,

Mgabre, 1964 abbreviated first by 5, then by

1465 | 293 | 1 4395 | 879 | 3

Scholar. Str, A thanks you much, this is

Malter. Do it is, but yet not with fambing, if you can without that division by memory, the the greatest number that may divide example the greatest number that may divide example both termes of your traction proponed, ten need you not to use that division, as in his traction \$2. Is see that 12 is the greatest number that can divide them both: and therefore without any worke, by memory onely, I have that into; but this ability in knowledge to got by exercise.

this kines there is when your fraction hath am cyphers in the first places of both termes, the may you by catting away the Cyphers, mile a bytese reduction as thus: 45 here take map the cyphers, and it will be 2, which is

fame in value with :::

Master. Pou are deceived, for you take as more cyphers from the Numerator them for doe from the Denominator, which you map not do.

Scholar. I confesse my fault, which came two much hatte, I was more gladder of the Rule

Rule then tothe in uling it : but now I make

Stand it 3 trust.

Mafter. Then map I goe in hand with the fifth or laft kind of Reduction, which teachen how to turne any fraction proponed into am other Denomination that you lift, or into am part et common copnes, weights, oz mealures or fuch like.

Thefifth kind of Reduction

To reduce fractions to a denomination appointed.

For declaration Whereof, first you shall in whether your fraction be a simple fraction, en else afraction of sundry parts, I meane of n termes then two. And if your fraction be a Etion of fractions or otherwife compounds your reduce it to one simple fraction: And then m well the Denomination of that other fraction in which you would turne this: for by that deno nator you must multiply the numerator of s first fraction, and the totall product thereof you divide by the denominator of your first for on, and that quotient shal be the numerator of denominator proponed: es for example, I have to fraction , which I would turne into ten part therefore I multiply this 10 by 2, that is the merator of my fraction, and there ariseth ! which I divide by 5, and the quotient is 6, w must be the numerator to 10, and so ; will be

Scholar. This is easie enough to doe.

Mafter. Then thall pon fee another gran of the fame fraction that is not fo eafe: a I would tarne ! into 8 parts, prove you morke.

Scholar. 3 must multiply 8 by 3, and the amou mounteth 24, which I divide by 5; and the another is 4, then is the new traction 5.

Milter. And Ice you nothing doubtfull in

sholar. I fee that inhen 24 was divided by processined 4 which I did not page of manie ye spake nothing of any remainer but help of the quotiential downs.

India you in Division of inhole nambers, indian should not passe of the remainer there in dulid not passe of the remainer there in dulid not in dulid not in dulid not in dulid not indianally note it as a summe that could not indianally note it as a summe that could not indianally note it as a summer there is any numbers, not shall set it over a line as a summer, you shall set it over a line as a summer, you shall set it over a line as a summer, you shall set it over a line as a summer, you shall set it over a line as a summer, you shall set it over a line as a summer, you shall set it over a line as a summer, and set the Division notifies the fraction doth make the Division notifies, and is part of the quotient will had so in your former work when 24 thas sinden by 5, the quotient should be thus, 4 and 5 of 4, and 60 the new Fraction about be thus, 4 and 5 of 4, and 16 the setter number, and 4 of 4 part at the property should be thus, 4 and 5 of 4 part at the property should be thus, 5 and 5 of 4 part at the property should be thus, 5 and 5 of 4 part at the property should be thus, 6 and 5 of 4 part at the property should be thus, 6 and 7 of 4 part at the property should be should be come.

Scholar. Then I take a Croinne, inhose is the power of it is the same a cumbrous with to doe.

Malter. Indeed to twhole pence, your ex-

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Scholar, Stant and The Stantage

Scholar. A had with Arter of the Piers, A had with Arter Crown is 3 for lings, which is 36 pence, 02 72 hade pence Post if A sin Arrow that this leacton 4 and of 4 be equial unito 3 Williams, then am A many arminers of 4 armin

which are then equal to 4, and delice are

Maken I commend you to the dillings for pallings, your dillings, your dillings for a better the state of the

But now one example more for this Rumo then see hall end it. If I have of of a beraigne (accounting the Soveraigne 20 lb

Lind

the shi

go bill many Willings is that the cholder I mak multiply by io, and that me wil be o de of in feller termes t. Chat is 19 ibilings, and one ibirt fifthing, that is 4 pents, as by the the four may probe. And this to: this it fulfice for Reduction. And now I CEDIO Addreson Stanna

Henfoever you have any Fractions to be added, you must consider whe- Addition the they be of one denomination or of fractinot, and if they be of one denomina- ons of one tion then had the numerators tagefor that that amounteth for the numeratoo the common denominator, and to have fordine . The real on is, because that such differ linkin Addition or Subtraction from the worke folgar denominations, where the denominabe of the number, as 3 pence and 5 pence, whe 8 pence, where the denomination is not aland. But if the fractions be not of one denomistion, or any of them be mixt of whole numbers adfractions, then must you first reduce them to denomination, and after adde them. And if be many, then adde first two of them, and so summe that doth amount of the Addition, and the third, and then the fourth, & cif you have so

Addition denomina-

Scholar.

Scholar This feemetheaffe enengt on that I have already learned to reduce, wi ant which I could never babe incought t And therefore now I fee good reason into the place Reduction before Addition.

Malter It is well confidered; but pet r

not to expedie your understanding of it thall falkfre for Rechartle

erample...

Scholar. Then would Jadde first ! in and because the Denominators are (and so needeth no reduction) 3 abbe 7 which maketh 12, and then is my fumme that is, in smaller numbers being abbre ted :.

Toadde fractions of divers denominations.

And if I have many minibers to be a as here ! ... first 3 must reduce cause they have bibers denominators Denomination, and then they well be on in lefter terms, the which Addition do make . that is 2

Malter. Row map we go to Subtraction

de ar denomin and the tree the desert Who of the war dery as a percent before the de cham de vien all Bur if the fractions be so a conse descent

35 0

in, or any of it in be poire of whole must alfractions, they much you had a feet decomination, and after ad a tirem.

of many, then all for two thems Amme that down in some of its hills which, and they the large of The

Subtraction of Fradions.

er con in the coe remainer Vetraction bath the fame pre- on of fra. copes that Addition had, for if Rions. the Denominators be like, then must you fabre atto the one Numerator form the biben, and the rest is to be set over the common

sinator, and so your subtraction is ended : a aid if you have many frattions to be subtradont of many, then mift you reduce them to Dennomination, and into two feverall feattiu, that is, all that must be subtracted into one atten, and the refidue into unother fraction, Miles worke as I faid before. But

Sholar. For the first example 3 take 10 to e witraced out of 17, and the rest will bee the letter. And niber that I hath born hates

For another example, 3 take; to be Inb ratio out of 4, tobich 3 must recure, and it of thus hand to be the hand

den do A labtract 24 out of 28; and there b 4 tobich 3 fet ober the common mominacon for a Remainer, thus !! that 168 and 9 bring multiplied by 8 restocity

on to the third example, 3 take anno dabtraceb from and ? and because Denominators be divers, I Doe reduce into one denomination thus : # 15 a whole number, tohat Could pon bottern

E bent

Subtraction of Fractions.

Then doe I adde the two first, a they make it. Also I adde the two last, and they yeeld it. Then doe I subtrait 3040 but of 3408, and there resteth 368, so is the remainer.

that is in imalier termes it. And thus be pour bon more to least me

Mafter. Prote one example of more fractions of bibars denominations.

scholar. I take the awo fractions? to a subtracted from 1. which is an arranged being reduced, will frank the contest of 2. how the subtract of 8 and 1. So the subtract o

tro the

on.

Who

prop

missions the fractions : so you can never in tractine greater out of the laster, although many adde, multiply or divide the greater in the lesser. And albeit that I hath both his too lesser than I, yet is I the desser fraction in generally if you multiply the Numerators the Denominators of two fractions; the manyer, that fraction is the greatest formerator comments the greatest formerator of multiplied by 8 yeeleeth 72; therefore is the first fraction of the greatest formerators of the greatest fraction of the greatest formerator.

a whole number, what thould you doc?

The greatest of two.

Scholar, Marry I would reduce the whole nber into a fraction of the fame denominabating fraction is, and then worke by

the se may you doe, but it is much frout fraction be a proper fraction, to to lan lefte then an unite, to take an umetrom the whole number, and then turn it tom improper fraction, and to two he pour Sberaction. As if I wonto fabtrac 3 & from 41 map take I from 4, and form it into ! . tron which I bate 3 ;, there will remaine { .. and the first fraction be an improper fraction, then map I take to many unites from the whole number, that they may make an improper fraction greater then that first, and then worke by Subtraction. As if there bee is more then 3, and not lo much as 4,3 mult te from 6, and then them into thirds to abate , and from , there refleth b he woole remainer is 2 . De elfe pou from pleasure take 3 ;, which is y from hold: then fet i under 6, as thus : And reduce those two fractions into one mination, as here appeareth; from ?

en 13 pour belire. And thus I make an end of the work instruction of fractions, and

ciplicatio

Multiplication of Fragions.

Multiplication of fractions,



Herefore when any two frathe proponed to be multiplied by the multiplied by the merator of the merator of the ather:

Jumme that amounteth thereof must be in a new Numerator likewise the Denominanthe one must be multiplied by the Denominanthe other and that that amounteth shall be in the Denominator, & this new third fraction we eth the product of the multiplication of the two fractions proposed, whereof

take this example, multi-

Scholar. I perceibe then that 3 being the Numerator of the first on, is multiplized by 5 being the numer the fecond fraction, whereof amoun the numerator of the third fraction and wife, being the denominator of the fi ction, is multiplied by 12 the denomin the fecond fraction, whereof amountely new denominator fo that 3 perceine t worke is bone, but I doe not perceive is greater then t, for if a wall use my manner of examination by the parts coine, 3 fee that tof u Crowne to 36 and of a Crowne to 25 pence, tobere one multiplied by the other, both mat pence, which is 15 Crownes, but by rour tiplication Multiplication of Fractions. 29

plication there amounteth 2, which is but is pence, and that is much lefte then any other

of the first fractions.

plation in whole numbers, and multiplication in whole numbers, and multiplication becken numbers; that in whole numbers, then that amounteth is greater then both after impered it came, but in fractions it contractivities for the fum that amounts in is lefter then any of the other two fractions areal it is produced.

colar. I defire much to understand the

mon thereof.

Miler. Although I purposed to reserve the usions of works Arithmeticall sor the persect Books, Arithmeticall shew you this

male of the Arangenette of the work.

who lee in whole numbers, that of two more being multiplyed together, is made the but number, which third number both beare have proportion to the number multiply-

the fractions the third number which which the fame portion to each of the two first fractions the ather of those two fractions both bear

munice.

cholar. Sir, I understand your words siden 40 is multiplied by 12, there doth omt 480, which 480 doth contains 40 many times in it, as 12 doth contains untain is to say, twelve times. And so it

apper.

appeareth that 480 doth contains them, many times allo as 49 doth contains who that is 30 times. But note Afea not being third number in this example of Fractions contain any of the two former (as it being ed in whole numbers), feeling this letters.

ether of themal man

Mafter Romerbett if pon cannot a thing which is not politic to be free a man, how the chird sumber in Multiplic of Fractions (bould be greater then a two former Fractions : but pet this me fee (which 3 lato) that the third auchte fractions to multiplyed , both beare the proportion to any of the two former frame that the other of those two fractions both to an unite as in your example i be to tiplaco by ... both make !.. Poto Tay both beare the same proposion to soft beare to an unite, as you may own forme of syamination by Come? for in an oto Angel (which in times per current (027 thillings to pence) are 180 pence, which I fet to the intice unico. parts (according to the fractions aforela thele, for a fet 45 halfe pence, fort tall halfe pence, and for put 75 half penceboth 45 bear the fame proportion to Too 75 both bear to 180, to: 45 is 1 of 100 15 75 alfo ; of 180.

But these reasons may be better roll till another time, when the knowledge

pro-

Mulciplication of Flactions.

SPOI

which the derver that be taidht wet the Tollogia Bewill their pour holle it o palle Whit in fraction the third mult need be letter then any of the THE SHOULD STATE OF CHE

fibe that objet a fraction is pro: Note ? ain the Counter example haf if bematmond them will will make more entice oumber As ff I maltiple ? ob to male detaile it stines, it will he raine whites Bramplesin a Crown maketh who Hide ! tobich it I take rise thenth amount to is shillings that fg. dibire Grannes: to if Stalle the fame imidelle with covery & faillings that its entire Crown, and 4. Pow if 3. Dakeut is ft-cannot be mise then thinks before hillings, And if I take if leffe then it cannot be fo much as it was before. lealng that a Fraction to lette then one; altiple a fraction by another fraction: eth that I doe take the first fraction once and therefore the forme that th. maff needs be leffe them the first

ply the Whiteston will be fred the All ply had Mar. Sir. I thank pour much for this And I fruft I do perceibe the thing, example of this fame fraction ! A wil er. ded taket of a Crown once, that is to if I multiply by r, it toll beas it was but hitlings i fo it 3 desmaltiple to at to. if I take but halfe one time, then

Multiplication of Phicion party to tiply it by that is, if At orans, termin proton The front author of the other present seeling

Hill traction, which the detpett, that the mall needs make firefinates the misch pa groende Abbith that the Andrie that the Serve the second seem of the parties of the parties

findertraiting in this that of maltiplic the control of the co

ply a whole number into afra Rion.

To multion the share marker casto see leadinged with Riens and may bee in two forts : for eith mineja natiklik in for at friencepi frattingali theimbledphateine effe the mbaterniumben unim with mine or two of the Figure inner and formal Inter maken berrof tafir beinerke for then reducts but we reduction bus over ply the Numerator of the fraction by than number, and the totall thentoffet for the none menatorall edition of In Part & on B

Scholar. 3 underffand pou thus. have to be multiplied by 16, their mul multiply that 16 with 64 to hich to the him rator, whereof commeth 96, and that will fetito; the new Numerator : keepingull

Muliplication of Fractions. distance and to the fraction will

And in this feet of posts, you may the labour those If it bappen the deto be fuch a number as map stente the fait whole number propoof officer for the former denominawho will the humeraron, and to is in a core was independent in

The sementhis example ? to liplyed by sand because smill justly the quotient of bibilion which is 4, and let instead of womands to Aberfraction will be a that cimie inactiver a totti make it i or elle il

Musica Athich is all one with the that sall spring stallower of the other fort of tour o make mad he to reserve the softradule

sometion Nones ben for the other fact, where the How to mixt num A pholomamber and frattion into one improper bers Blue (met flowert gas in Reduction) and then tiply them together, as if they were proper fractions,

Scholar. 13; being fet to be multiplyed fire I must reduce the mixt number, wir this example appeareth, by multiplying 13 by 5, and 13 5 that maketh 65, whereto 3 mut node the numerator 3,

304 Multiplication of Pricition!

and the fraction will be to indicate the Rections now 3 thall multiply after the second

Mafter Son babe bond toell; and some ponfee, that although most plant of the form of Mulciplication may be introduced to the Reduction, get some cannot, as well as numbers.

And yet one note more beit

you would multiply any Fraction by 2, which is mostly it called Duplation from many du britain by doubling the Numerator, bould by positive Denominator into half, if it be eased \$10 mm. Scholar. Then if I would possible and the chalf whether I will make if \$100 elfe and indexed I lee that is all one, but that the bill bring of the Denominator seemeth the tatte way to make smaller terms of the Fraction and so they shall need the lefte Reduction.

Matter. It is to: sub now I that not not to tell you that Multiplication is protect to Division, and Division ffectoff by malciplication: but the like work that I ffetner you is Multiplication, will I frem you in Division

alfo.

Auto of Comet to the total the total

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2

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bers.

Division of Fractions.

Distiliated gradinal

proposed, that one flound of Fractite divided by the other, It ons.

function that south be dicuided (which is called the Dividend) of then after it

in the which is the Divisor: Then first I multiplus Numerator of the Divisional by the Deminuter of the Divisor, and that which aminuter of the Divisor, and that which aminuter of the Divisor, and that which aminuter of the Divisor, and the number
that amounteth thereof I must, put for the new
I maintainer, And this third Fraction is the amolimit the said divisor.

cample thus: If I would divide by his, first I will be have as by the land of the bearing the Numerator of the Divider, and thereof rifeth 30, then

mater of the dividend) by 2, being 5, 2

artistip r6, the which I must of 16 and

Malten spe feemeth you are quicker in un-

taught pouthe Art of whole numbers, but the is no marbell : for the more knowledge to a man gettern, the readper that he finde wit, and quicker in understanding : but pet two things I will adminish you, while and lightness of understanding, the the Quotient.

Webenfoever pon divide one Er another, either they be both equal of elle the one to greater then the be equall, their quotient fall be fuch, that Numerator and the Denominator of it their equal allo And if the two first fractions inequall, their quotient thall beclare the in by the inequality of the Numerator, and nominator, as in these examples follo thall appeared

First, if equall fractions and be en together, and if the one be dipided by the offe the quotient will be the as you may percent

by that Rule aforefaid and File and

Pow in the unequal fractions, as & link the quotient will be (") where the numerate ts greater then the denominator. Tuin. Toll

Scholar. I fee it is fo but I fee not the fon toby it thould be for the base wit and 30 roun

Mafter. The reason is this : when in fraction is divided by another; the quotien beclareth what proportion the dividit beareth to the divisor son attitued by maketh a , tubich muft be founded not 2, the twice

Note how to know the proportion two numbers.

wice, beclaring that is tontained twice

quotiene, as foun as any of them falls note this, that the Numerator in the ent representati the Dividend, and Denominated representette the Divilor: tits is alwayes true, whether the great attor se divises by the letter, or the lefthe greater. But this proportion will etailly Englane, fill you have learned proporcions : not with ambing empat of it I have beclared in the Rule of But note for the raffe rememof the quartent in division, as foone have fet downe your two fractions the magaint for other, then make a fraight the quotient and as foons as pon multiplied the Nameracom of the Divisit, by the Denominator of the Divisor, mumber that amounteth over the the and their multiply the other tino monters, and let their totall impersthe lame

similar. I perceive you mould not have united to memory till I were better expert, of effectiones I happen by mille remembere to be abused. This example I take for that declaration.

To divide a front the offer and the feet the num.

To divide the offer a fraction and the offer and

an anake another line for

dictance,

quotient, as foon as any of them is may be them is may be them is from as I have making the person of them is making the person of them is making that a described that a described them that a described them is the person of them is then that of many be let and the land then whole quotient appears the indicated of the person of the perso

Matter. Mithough your might better precipe it by the Rule of Reduction, yet the ample may be vectored, in common color, and a common chilling of its pence, of the ample maket a pence, and a both maket a being and to goo may easily fee that their propose one bool agree Mand if you had taken this comple before, when you took the example of a picture quotient would appeare has this continue easie transpersant their proportions that their perfective, being per little acquaint with proportions.

history by a Braction, both that I were it?

To divide a whole number by a fraction. divided by a Fraction, you make which is all whole number with the Demonitary faithful Fraction, and fet the small than faithful Numerator, and a formula the Denominal

Dill succe,

Numerator of the frant mai ried of

pobe se os et ib battete example, 29 attitoed Sty !

and in as bere ap

pare that war about 18th samp new for but of you would divide the To divide the fraction by the sumber, then multiply the on by the countries on by the totall for the Denominator, without changing number. Miter. Eberr inke tole nothing

from title De orginators be like then b plar . Ther to dibide 3 if mill be 57, an bere, 22 bp 4 melb ii by t in this ex-, 13" it biol gen. Iso accoratio, if one of the it

cors may juftly histor the other by that n. Hou lay well. And by the fame ex- Ancther per ran gine me cante to remember anos briefe way. Motele imay to rosothe fame : for if pour Wolded the fait Nomeracon by 4, and let quotient for the numerator, keeping till deserminator, it would have been not the fuell done, but also thirt fraction of des, by which I mult multiple. toward

side of mode at to be even lo, by a like that you taughtme ter Multiplications mi proofe thereof & being the attituent, 4 the divition; B. dividedthe Numerator 20 sand the quotient is is to bick I let for ther 23, thus il man I fee that do is all with; as by dividing an abboutating thehele termes by 4, and fo reducing them

Division of Fractions.

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to their least Denomination, 3 may and probe, as appeareth by this example, 15 17 ...

Malter. Pon conceive if well. And it be mixt numbers, (either one of bett) years first reduce that mixt number into an imper fraction, ethen work as your pape turn. Scholar: That was furtherently tapped.

Scholar. What toes futticiently tauge Mulciplication. Sheretore 3 pray you me

ward to some other things

Master. Then take this note pet to his
fion: If the Denominators be like, then done
the numerators as it incre in whole number
and the quotient, whether it be fraction; was
number, or mixt, is a good quotient to be
division. And generally, if one of the numerous may justly divide the other by that quotient, multiply the Denominator of the like
Numerator, and set it that both amount in
roome of the same denominator, and the like
numerator to it, set the Denominator of the
other fraction.

Scholar. Then it I would divide 4 bill fee that 3 will divide 1 wand the quotient whe 4, by which I must multiply theotics that is the Denominator mider 3, and that is the Denominator wider denominator 4 over 15 in Central 3 I must let 97 the Denominator, Flour it that 1971 dia adia

 Make this if the Numerator be answen numin fer the halfe of it in his place without the diiles, and so have you done: and if the Numerato mot even then double the Denominator.

E. de de la companie de la companie

make a and thus will a make an end of the make of common fractions for this time, not willing hat pour can apply them floth to the Ricor Progrettion; and also to the Golden Ric, without any other teaching then you be learned before, which might feely tedions to make, in regard you have sufficient known loss in Reduction, Addition, Subtraction, Makeplication, and Division: And therefore will goe in hand with the Rule of proposition, Coolden Rule, which now will appears the goods.

Golden Rule direct in Fractions.

auag Mafter, o.

Herefore as touching the Gol- The rule den Rule for the placing of the of proportion, in Fractions. from whereby to finde the founth, and for the forme of their worke, with other like notes, I referre you to that

You have already tearned.

10

But

Note this for algenerall Rule, But this easie form of working by sind one shall you note, that it your three number bee fractions, so, an apt work and termin multiply the numerator of the sirst number the question, by the denominator of the cond: And all that against multiply by denominator of the third number, and there is shall you keep so, to be the sirst number by the numerator of the series and the whole thereof by the numerator is the chird, and the totall thereof shall be pudividend.

Row dividend by the dividend b

A question of velvet.

If i of a yard of velver cost of a Soveniesteemed at 20 shillings, what shall i cost?

scholar. If it please you to let me the answer, I would first place these numbers as I learned in the whole numbers, thus:

And then according to your new rule, must multiply 3, being numerator in the number, by 3 the denominator of the face and thereto commeth 9, which I multiply gain by 6, the denominator of the third ber, and so have I 54, which I have so divisor. Then multiply I 4 the denominator of the face and there artseth 8, which agains I multiply I amount of the face artseth 8, which agains I multiply I which agains I multiply I when I multiply I which agains I multiply I which I was I which agains I will be I would be I will be I wil

to Then must 3 divide 40 by 541 100 milety

mes and then the figure will a

But what that is in money 3 cannot fell, and 3 feath week to 10 200 and 200 an

er. It forceth not now, you may reduce pour lift, but it were diforderly done to mingle bivers works together, where to not feeke the balue of the thing in comnon money, but in apt number, which yes ne well bone : and therefore will 3 pet pon another like way of enfinelle in the boto you may change your three fractibil notice; as if the question were proponed hwhole nambers. The first number you shall taught pon : now to finde the divithe fecond number, take the numerator selecond fraction: and for the third numthe denominator of the first by the numenot the chied, and then worke your quemired) of onoone

dolar. For example hereof, I put this questi- Aquestion

Saveraione, what is of 1 pound the worth ?

for the answer, first I place the lions in order, thus: Z

numbers, I mattelly and that the numbers rator I the first by 4 (the denominator of the focond and there commething which I me tiply by the denominator of the third an amounted 88, which 3 letters the divisor selectiff place. Then in the second places in 12, which is the numerator of the feroid Serion, and in the third place, I let the fun sumountetbot's being theid chominaton Hill humber anuttiplyed by inte in pier of m being numerator in the third at 88 700 of number, and to the agure wild 12 Lin non mand as here poorfest that a sneed find the mi Wen to work it forth, A multiply mi fa, and there amounteth 144 which 3 Dy 88, and the quotient will be 1 4; opinion Stermesur 229 and then the dill 11 14 7 4 11 Highres will fand thus : 2 . 2150 - 15 mil -ivi Mafter. Thefe two formes now pour The proof Band well enough, and as for any other of the gol-r time I will not repeat, onely this that a den kule. - mark for the minof of this Rind. Inbether ivozkie weil wonght oz na mattplat number by the fourth, and note what am eth; then multiply the fecond by the third -mark what amountethalfo. Row if thek

> work well done; elle pou habe erred. And well toffice for the former Rule.

the universified inter the

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Id

humbers to amounting be equall, then is

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follow F Come idental non var 18290

he Backer Kule, or Kenasheib s 1, ingied & amilipid by 2 s the de

werfe Rule an Fractions. dividend: then I minifiply 4, the denom

> Ut in the Backer Rule, this shall The bacyou note for ease of worke, that ker Rule you multiply the Numerator of the in Fractifirst by the Numerator of the se-

cond, and the whole thereof by the

denominator of the third, and that amounteth munof, shall be the dividend. Then multiply also for a the denominator of the first, by the denomina- generall tor of the fecond, and that whole by the name- Rule. morof the third, and that that ariseth there-

of hall be the divisor Example of this. Ind lend my friend ? of a Porteguise, fever A question Mouths upon promise that he should doe as much of Loan. againe; and when I should borrow of him, nee could lend me but 3 of a Porteguise : now I and how long time I must keepe his money in recompence of my loane, accounting 13 Mo-

ells in the year?

Cholar. The first number mat be the first ey borrowed, that is tof the Porreguile; second number the 7 moneths, that is 3 of tar: and the third number the money was lent in recompence, that is it of a neguise : then I set the bers thus:

Then (as you taught me) I multiply (being numerator in the first number) by the numerator of the second number, and maketh 21, which I multiply by 12 the denominator of the third, and so have I 257 for the dividend: then I multiply 4, the denominator of the first, by 13 the denominator of the fecond, and it yeelbeth 52, which I multiply agains by 5, the numerator of the third in the mill make 260, that is the divisor. Then mill of the 252 by 260, so it will be in the mill fraction of the again.

Master. And thus do you see some entities the working, better then to multiply and but

teologily lo many Fractions.

Statvte of Affise of bread and ale. Another question yet will I propose, to the tent you may see thereby the reason of the sutute of Assise of Bread and Ale, which we Statute Books, in Latine, French, and English much corrupted for Want of knowledge with Art; for the right under standing whereof, I propose this question.

Question of bread.

When the price of a quarter of Wheat it shillings, the farthing white loafe shall weight shillings; then I demand what shall such a laweigh, when a quarter of Wheat is sold its shillings.

Scholar. This question must bee wit

Fractions.

Master. Sou seeme to say reasonable, beit in the Statute of Assis, the rate is

to the proportion of parts in a pound weight Troy, else could it not be a Statute of any long antinuance, seeing the shillings doe change that, as all other moneys doe but this statute was well understood, is a continual Rule for me, as I will anon declare by a new Table of this, converting the shillings into ounces, and make of ounces.

Therefore here by a shilling you must contain to a pound weight, and so by semps, of an ounce: inherefore although me might work this question proponed by note numbers well enough, for that time that he statute loss make, yet to apply it is per time, and to make it serve for all times mailly, it is best to worke it by fractions, thing for 2 shillings to mode of the shillings that so to so the statute of the second of the shillings that so to so the shillings the so to so the shillings that so the shillings that so the shillings the solution is so the shillings that so the shillings t

hope and then will the Z

In which question, because all the denomisators be like, you shall worke onely with the
merators.

Scholar. Then Chall I multiply 68 bp 2, threof commeth 136, which it I divide by the quotient will be 45 \frac{1}{2}: but how Chall I with a fraction of that, to Cand with the for s

Master. Have you so some forget: 45 = what was taught you so lately ? 20

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Scholar.

Scholar. 3 remember it now, and the fantipeth 45 twenty parts and the chird del of one twenty part. and pulsas and mil

Note what is_

Mafter. So is it that maketh in Shilling afhilling hillings a pence, whereby you may non great errour in the Scatte Books; which ber confrantly 48 faillings to that Affile. Amb this Rule, if pou examine the Statute, pon a finbe many fummes talle a Mil beretoze in the true understanding of that Scature, sand like, as I have made mention of it, and what recognized it, to ba I with that all on tlemen and other Students of the Laws monte not neated this Art of Arithment as unineedfall to their findles. Therefore encourage them thereto pand to graticole them and albother in generall, I will eribi a Table of that part-of the Statutes in two lumnes, and fir a third columne, 3 millate the correction of those errours twich the crept into it. monel of Hashand, noillans bright 11

> as ad 80 aleithem E that notice Here followeth the Table. traction of that, to Cand toke the

Mider. Oathe pout fo foons toggete s gists almountment and induit

not be like you lead too he onch ball not now

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The Colden Rule Reverle

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Ed o	011 4	011 9:1		
and the same of th		1 4		

In the common Bookes there is no further rate of made, then into 12's, the quarter of wheat, but in cient Copy of 200 years old (which I have) there is the rate of Assic unto 20's, the quarter, but yet was Assic also either wrong cast at the first penning, or corrupt fince that time, for lack of juft knowledge Rule of Proportion, which I will adde here alfo to fuch as be defirous to understand gruth exactly.

The price of a quarter of Wheat	thing white load the Statute Bo	thing white loafe by by just Ale.			
g. D.	11. S. D.	1. 8. 0			
12 6	OIIO	01010			
13 0	0110	0 10 5			
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15 6	0 9 12	10 8 1			
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16 6	0 8 6	0, 81			
17 0	083	0 8			
	0 7 10	0 7 10			
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-	0 7 2	0 7			
	0 5 10	0 7			
19 6	0 5 6	0 631			
	, 01 31 01	0 613			

de ewo Tables I have fet fiverall, beman Could thinks that H would etive of take away from any Law those which might of right frem either fue settler diminute vout pet A may not curious as to medett manifest errours is not onely my part, but svery good de buty with sobjety to topsed. And olding of offence, I have rather bone it spitate Book, then in any Book of the Suntes it felt, truffing that all Men totil take imgood part. legence post map finds fine type types

Shotar I would with fo, but I bare not fo a fifth never good man that totald reforme mildis detentions which because they either dant of lift not to voe any good themselvs, waters to bark at the coings of other, but topavious. Tastofic.

Milley 3 confider many things that fome object, whereinte I am not myzobibeb make the antwers, before I hear their obmission but as I frust that men are of a better mure, and more gratefull noto then fome the been in times past. As I have done in Starute of Affize for Bread in rate of thil. Concern-To will I fet forth the like Table in ing the folbunds and ounces, and the parts thereof, that Tables. may be easily applied to all times: But I meane not by this to alter any wood of the Statute

A pound weight.

lowing

Scatute, (being to good an Didiname and mis great continuouse) but) oriely to make it as kings of exposition and beclaration of the be Statute, truftion that thereby the Statutem be better girber food, and confequently bette put in execution. And here you thall note that have accounted the shillings after the roles of shillings to the point weight, because effeeme to the most apt for our times the fore in the first Columne pou finde the prices Wheat ofrectly against it in the ferond Columne, you may finde the weight of a famble white Loaf, in this our time and if you bou ble the number (as 3 bate done in the third Columne) then have you the weight of the hills penny white Loafe; and for in the fourth Co. lumne is fet the weight of spenny whireless It needeth not to tell, that the light goth tell fie, bow that every Columne is partering three smaller pillars, whereof the first Coho bath thele; there ricles pounds, ounces, in penny weights. And as in the first Column 12 pence make a shilling and 20 shillings mi a pound, to in the other three Columnes of pence weight maketh an ounce, and 1/2 ounce Mire, and there gentered .bauoq astam oo the been in finica pate. Als I batte done of

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with an income grant collection of the state of the

Botle Reader, touching the inderstanding lof the Table following, wherein accordant pour time, Master Record alloweth 60 meto the ounce, and 3 paund or 60 shillings to be paund Troy, doth hee frame or induce this his Table, beginning at 3 shillings in marter. And this his proportion (for that he both not set down any one Example to common the work) hath been hard for many manager or comprehend, and therefore the onely thirt cause why I have written this dimension, for the beauty understanding of him them.

形四中

彩雪唇包裹草犀形於

The first thing therefore that is fought for in MeTables as in the other aforesaid, is a Maxim grounded upon the Statute, which is this. When the quarter of Wheat is fold for two filbrithen the farthing white loafe shall weigh billing to whereby a filling is meant it of a and by a penny, is of an ounce. Now derfore for a generall Rule, to finde what might the farthing white loafe thall weigh at bilings the quarter, till you come to 40 fbilhigh 6 pace the quarter, is thus to be wrought. comming to the first ground, and working by the Backer Rule, say; If two stillings the quarter give, or allow the farthing white loafe to weigh Shillings, what weight ought the farthing white loafe to weigh at 3 shillings the quarters? Worke, and you shall find 45 faillings 4 pence,

as before in the correction of the first Table noted. Then for the formed work, day by Rule of 3 direct, if 20 peace give one ownce, when giveth 45 Stillings 4 pence ? mulciply and vide, and you shall finde 544 ounces, which 54 ounces being multiplyed by 3, for 3 possel 60 Shillings, yeelderh 1632 ounces, which divide by 20, produceth 81 ounces, and 12 or mier of an ownce , equall unto 12 pezny mile, which is halfe an ounce, and 2 ponny weigh, and fo maketh in all 6 points, 9 ; ounces, miz penny weight. Now the next way to comine this Table, to know the weight of thehile penny white loafe, is thus, multiply 1632 one by 2, and it bringeth forth 3264 ounces, and vided by 20, it yeeldeth 163 ouncer, and ! which is equalito 13 pounds, 7 ounces, and penny Weight, as M. Recordibis Table noteth,

Thirdly, for the weight of the penny like leafe, multiply 1632 ounces by 4, and dividing 20, and after by 12, as before, and yould find 27 pounds 2 ounces, and 8 penny weight. This Method, or elfe by doubling the family white loafe, for the weight of the halfe pur white loafe, and so doubling the halfe pur white loafe, for the weight of the penny will loafe, is the order to continue the Table to the series of the penny will loafe, is the order to continue the Table to the series of the penny will loafe, is the order to continue the Table to the series of the penny will loafe, is the order to continue the Table to the series of the penny will loafe, is the order to continue the Table to the series of the penny will loafe, is the order to continue the Table to the series of the penny will loafe, is the order to continue the Table to the series of the penny will loafe, is the order to continue the Table to the series of the penny will loafe.

end thereof.

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1			10	43	- 1	1 - 11

dwing poken before for the understanding of the Table, placed by M. Record, a man indued with rare bedge in Arithmetical & Geometrical Proportions, be Statute of Coynage, and the Standard therpeareth in bis Epifthe of this Book, dedicated to ward the fixt, infinuating unto his Highne Je, that the ard of Coyne, is much altered form the 14 year of ward the third (when this Statute and Affile was to the Standard of this our time. For it appearwir K. Edward the thirds time, when the Affife of and Drink was established; that a Sterling penny, without clipping, did then weigh 32 cornes of hest dry, and taken out of the middle of the ear, and 20 find pence made an ounces of 12 ounces made a pound wy And fo from the weight of a penny, to 20 shillings which then weighed 12 ounces, tooke Bread his the and proportion. And now finding 60 pence is an unce ! That onely canse (I perceive, for the zeale of a Comen-wealth) moved him to fet downe the same Table. with private Books meaning not thereby to alter any manifishe Scatute, being so good an Ordinance, and of so my continuance but as a kind of expatition by the way that months Statute may be better understood, and so consewhich better put in execution: Which Affile of his, is times greater then the Statute now alloweth: Therefor alfo (to gratifie fuch as are defirous of knowledge, acwing to thefe prices of a quarter of Wheat) I have ad-Mothis Author these three other new Tables followand reduced their prices into their just proportions of ing money; and also reduced the money, into knowne the Troy, according to the Statute. And thereafter acding to proportion in my other three Tables, have I nodibe just weight, that a Farthing, Halfe-peny, and may white-loafe ought to weigh by the Statute. The

T di.	f, d.	po. oun penny ces, weight.	po. our pen
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0		8 1 3
	L: 2	Saba

Scholar. Sir, I be thanke you most beath ly for this, not onely in mine otone name, and in the name of all Students, but also in the name of the inhole Commons, to inhom the restitution of this Assis (I trust) want bring restitution of the weight in Bread, which long time hath been abused. And it you know any like things more, inhereta you want bouchfafe to beclare the errours, and let industry that good bearted men that love the proof all good bearted men that love the pro-

mon mealth.

Maker. I have landed things to declare I have releaved them for a patoate Book it felse, yet notwithstanding because the fuse of the rate of measuring of ground common, that it toucheth all men, and you more common then needfull, but so much rupt, that is, too sarre out of all good rate onely in the English Books of Statutes, monly painted, but allo in she kating Books and in the French allo so. I have readed for, and conserved them officerity I give you a Rable for the restitution of errours, as may suffice so, this present And first I will propose one question to touching the use of that Statute, inhered may perceive the order how to examine twhole Statute, and every parcell shereof the question is this.

A question of measuring of ground.

Whether the Acre of ground doth contain Perches in breamh, then must it contain 40 in length. Thendo I demand of you, how Shall the length of an Acre be, when there is bread of it 13 Perches. But before you an wer to the question, I will doctare unto mother Statute, which is the ground of the restaute, And that Statute is this:
Lia or Dained that three Barley corns dry Statute with measure of an measure.

bethe inches thall make a foot, and three all make a part, (the common English s have an Cine) five pards and an balle a Derch and forty Perches in length, in meanth thall make an Acre. This An Acre. Seature, inhereny you may perceive, a intent of the Statute is that one acre contains 160 liquing Perches, Poin beare you and our to the apertion.

cholar. As I perceive by the words of the e, a Perch to be the part of an Acre, I make those numbers all in Fractiand so worke the question : but seeing 3 toe it also in whole numbers, I take that to the most enter therefore than I fet

mition in forme, Then

multiply 40 by 4, and it

and the quotient is

after. Pow turne that f into the common sof a Perch, as they be named in the er Statute: bowbeit it thall be best to one of the leaft parts in Denomination Z 3

of foots of t

the Perch containeth 16 .

Scholar. Then to returne i inco feet, amultiply 16 hby 4, and it maketh 66, while must divide by 13, and the quotient is s.

Malter. So I finde, that if the acre bold in breadth 1 3 Perches, it thall contain in length 12 Perches 5 Foot, and , of a Foot, with to not fully an Inch, for the Inch is the Foot. But here all the Statute Books in 16 tine and Englich (that I have feene) do mb it to bee 13 Werches, 5 Foot, and one Int which maketh above 13 Derches too many in the Acre: so that I would have thought the errour to have crept into the printed Books, by the great negligence that Printers in on time do ufe, fave that in waitten Coviend great antiquity, 3 do finde the fame : pet wie I one French copy which bath 12 Perchan and one foot, and that milleth bery littled the truth.

Scholar. Then I fee it is true that I have often heard fay, that the truest copies of the Statutes, be the French copies.

Malter. That is often true, but not generally, as I have by conference treed diversly in this Statute the French Book is most wrupt: in all other places lightly.

Est now to performe my promise, Interest forth the Table for measuring of an amost ground, onely by such parts as the Statut both mention, because at this time I does

Note this errour.

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uppole write it for the better under Kanding that Statute, and hereafter with other things intend to let forth this same more at

Table following, I have not done as in wither Statute before compared by restitution the faults crept into the Statute, but onely written that true measure, which the equity the Statute doth pretend. For it were vile to age of fo noble Princes and worthy Counsellurs, as have authorised and set forth this Stamin, that they would make one Acre in any form meer then another, but every one to be just and with each other, which is the ground also in worke : and hereby may all men perceive bro seedfull Arithmetick is to the Students of La. But now I think best to make an end of the matters for this present time, fith the Table bath in it none obscurity that I should need to leclare.

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The caddle of the Aere.	The	ength of	the Acre	areadah of the
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Scholar.

Scholar. Indeed, Sir, I understand the Table (as I think) by those other which you set south before. For in the first Colonine is set the Perches of the breadth of an Acre, a then in the two Columnes sollowing appeared how many Perches and how many Foot that same acre must have sor bis length.

Mafter. Dou take it well: bowbett to frenk eractly of breadth and length, and the first ca imme Doth fometime betoken the breadthand fometime the length : for properly the longes fine of any fanare both limit bis length, and the Moster live both beteken the breadth, pet it is no great abuse in such Tables, where man cannot well change the title, toletthe name remain, although the proportions of the numbers bochange: for fill by the first co tumne is expressed the measure of the one fine and by the two other Alilars in one Column is fet forth the measure of the other five. In this thall bee fufficient now for the nie of it Bolden Rule. and on our shore

The Rule of Fellowship



Ow somewhat will touch a taine other Rules which is their severall names may fee divers Rules, and distinct from this, but indeed they are branches of it: yet because

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they have feverall workings in appearant

lo pleafant in ufe, I will give you a tafte The Rule each of them. As for the Rule of Fellowship, of Fellowingle and double, with time, and without out time. Malineed to fay little more then Thave my faid in teaching the works of whole des: yet an example or two will we have michie the remembrance of the same; and geofit, as this for one. I H. D. a GIATITE GOOG

Low men got a booty, or prize in time of war, A question with it in value of money, 8190 pound, and of inequall I the men bee not of like degree, therefore lociery. the bares may not be equall : but the chiefest

will have of the booty the third part, and he mub part over : the fecond will have a quarm, withe tenth part over; the third will have the fur part: and so there is lest for the fourth: manery fmall portion, but fuch is his tot whembebepleased or wroth) hee must be content

20 part of the prey! Now I demand of Sholar. Pou must be faine to answer to

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webn question, else it is not like to be anmat this time.

later. The forme to underffand the folu-Athis question, and all such like, is this: ce all the Denominators into one nums --as Die Quitiplication, ercept that any of them urts of fome other of them, for all fuch you may overpatte, and take for them all numbers, whose parts they be: As in and strample the chares be thefe, its 717, 215,

If 3 mailing all the Eperiorstra make 14000: but conspering it of 6 3 Juil omit that 3, and likelight which is a part of 40, 3 may obstrate mother there is but 3 Denominators in tiply, that is 4. 6.4 20, tobich make 48d fromme I take to my mork . because Denominators will beginner in it. The take such parts of it as the question important that is, is, the test man and it, the is the - is 48, which I put in one fumme in first mans there, and it maketh 208. If for the fecond mans thate, I take 1, which 120, and 1 which is 48, and that maket the tobole 168. Boto for the third man mult have 1 3 take 80. And for the furt man there remaineth but 24, which with the tobole fumme: fo that if the int had been but 480 pound, then is fion anfwered ; but because the farm of greater balne, by this meaner now know the partition of it. I must let up been by the order of the Golden Rule, s in the first place the number of that I by multiplying the Denon The reason second place the fumme of the booty. looke what proportion is betweened number and the fecond, the fame propo shall be between the parts of that first a ber, and the parts of the second, compa each to his like. Therefore I muft vot to

of this Rule.

place, one of the parts of thares, and then the for the towner Rule of Proportion, or Rule. And between I have four feberarts of the from the facts of the fecond three but four like parts of the fecond of the feberalism.

olic. Bots I true I can ainfiber to pour of as by pour triples: I will prove. No try it. I let the foure figures thus, will A.B.C.D. to these their order:

School and whiled & specific Days and the second se

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when arears of them I married the temose by the thire, and broke their papers, and to amount ety the four the which I were to: I so it I be maked which I were to: I so it I be maked bloce by 450, always in the mother of the area maked in the mother.

The more than with the other three first and the state of the following them 2866; and then for the fourth the figure to very many there is tell the figure personners.

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80	1/3	95	list strong	40

The proof by Addition. And thus much I think I have some in Malter. If you influent your work and lift to prove it, and all the fluence four and if they make the totall, then feem well bone.

Scholary I may fet them	3549
thus: and then by Addition	28664
the just from both amount,	1365
that is, 8190, and therefore	409
(as you lag) it feemeth to	10
be well wrought.	8100

But I befeech you, is there any books

Maker. Pou, may eally conjecture, to pout did affigue the first mans share to the and so change all the rest, and one had an share, yet would the Addition appears all and therefore is not the proofe eras.

The just proof.

But it you will make a just proofe the first mans part, take 4 and ;, of the summe, and if it agree with the number figure, then it is well done. And so do second, third, and fourth summes, and proofe satileth not. Poin will I proper certains other questions, which have been

by certaine learned men, alleif not with fome oberlight which queftions 3 protest illy. I do not repeat to deprace those good whole labours and ftudies I much praife greatly delight in. Sutonely according profession, to feek out truth in all things. to remobe all occasions of errour as much me lieth: and for that cause Awill onely the questions inithout borting the Auon name. 351101

the first question is this. of non annual ability

Loure men did build an house, which cost them A question to crowns, their shores were fach that one man of building

dpay : of the finame, and fix trowns over : ferend should pay and 13 crowns over : whird man must lay out ? abating 8 crowns !! fourth man Marid pay's and 20 crowns Gan you answer to this question?

an 30, 3 sannot Sir, and that you Coloring man for 3 know no more babelaught medidio nog

Then I dave fay you cannot do tt. An impofpet the bell learned man that ever bid fible quele it : for the question is impossible. For fion. atton thereof it will be bold to ule first representation of the numbers in their forme (although 3 bave not pet taught manner of works) becanfe it may applainely that the question is not postiwhere I babe let the parts, and added and they make the whole fumme, And 30 more Polo, boto is it politile

to vivine finip either grains, sither charges, to that the particulars : ! that i

Scholar. It to marine the forme of proof by applition

of parts. Mafter, Don fay tents. And that perceive it the better) The trill tre the bulgar forme, as in this figure you fee where the ? with 6 over, is 1506, for the totall as you beard betope, to 3000, the fand the 12 more is 1012: the twould bee 2000. but then abating 8, it is but 20 more maketh 770 : which all being in one fumme, Doe make 5280, tober totall fumme thould be but 2000, tobich i of 2000, if you divide by 1 to 15 bute i of it, that is sayo, and th 30 more, then will those 3 fummes make 5280 : whereby you may fee bom this forme (as well as the other) both because that the particumore than the labole famine by: and thirty more, and therefore can that question not bee accepted me thing, but pet des certains learned men pomo fach questions, and anfiver to the

refore fomembat to fap to their ercule (raof their good meaning, then for their do. Inal anon beclare what may be faid propound the Question as it may bee

ight by good nonibility.

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offoure men build a house together, and it The forgreetheethat acotten as the first man doch stion of crowns, fo often the second man shall pay 4, building bird man 8, and the fourthman 3. Or elfe how postithat the first man shall pay double so much as ourth, and the Jecond man shall pay ; of the mans charges the third man shall double so has the second: (and these two wayes are to und) but further for their agreement it is apand alfo, that the first shall give 6 crowns ou and the fecond 12, and the fourth shall but the thirdman hall give no overplus Mousia & crowns absted of his charge.

is the question possible to be assopled, non of the feverall charges, and fet out numbers in that rate, by which you may the work to the Golden Rule, as here in think form, the numbers are already named, (48,3: and in the lecond forme (although they be but plainly named, pet they may bee te fame numbers & for 6 ts double to 3, and of 6; and again 8 is bouble to 4. Pato thefe together, and they make 21, which mut be let to; the first number in the Gol-

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den Rule: for if it with the overplus of an mans charge would make the totall summed the charges, then were those severall summe the charges of each man, besides his overplus but now it is not so.

The Rule.

But pet this is true : (fo excellent arecon clusions Asichmeticall) that look what proportion each of their leverall fums both ben to 21, the fame proportion doch the just die ges of every man (belides his overplus) to the totall of the charges, the overplush debuded : wherefore this may you note. before you boe apply the totall of his chies to the Golden Rule, pou must deduct the oreplus, which is 6, 12, and 20 that is in the whole, 38: but then 8 must be restored forthe abatement of the third man, and then ten eth to be deducted 30: take 30 therefore of 3000, and there will rest 2970 must fet in the Golden Rule, for the fumme : and for the third fumme, 31 each of the small numbers before men which although they be not feverall cha pet they represent them in proportion, & making (o) every mans charge, a feverall ftion, the figures will bee 4, which 3 mark foure letters, A. B. C. D. thus.

A	B B
21 7 2970	21 /19
6Z 8484	21 19
C	D. M
8 Z 11314	3 214
11314	3 424

capere I have fet for briefnesse the summe severy mans charge in the fourth place, presenting that you can tell both to try out that fourth summe by so many Examples as yes me had.

scholar. As I trust that I understand this are, so I desire much to know what may want for them that missook this Que-

Mafter. Pou feem to desirous to know this mout, that you have forgotten to examine, whether this work be without fault.

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scholar. Spe seemeth this work to be inell to, because the Addition of the four sevenil numbers both make the totall summe of 1970, which was to be divided into such four parts.

Maker. But then have you forgotten that the fit man must pay fix Crownes more bete fit man must pay fix Crownes more bete third man 8 Crownes lesse, and the fundamen 20 Crownes more: for without the pour first totall of 3000 Crowns will with made.

Scholar. Then must 3 adde to the first mans same 6 more, and then it will be 8542, which is seconds summe 3 must adde 12, and i will bee 5774: from the thirds summe 3 must abate 8, and then will the summe bee 1234 then adding unto the fourths summe

20, it will be 444%, and these foure summes will make 3000 which is the whole change, as in this example it may appear, where first Igather the that maketh 2, and so proceed I in the Addition to the end.

854

Master. Pow have you well done, and the work in the same summes, is brought of other learned men sor the true solution of the question, as it was sirst proponed. (which as I said) was impossible: and now examine by these severall summes, and see whether it don agree with the summes in the question proponed.

The first man must pay and 6 over of the totall summe: bow think you, is 854, the ball,

and 6 moze of 3000 ?

Scholar. Po that is not, for it should be 1506:and for the second man 1012: and so the third man 1992, too the fourth manyou whereof not one summe agreeth to this will. But I marvell, that so wise men could be much overseen.

Master. It is commonly seen, that we men will receive things from clder Write and will not examine the thing, they kn rather willing to erre with their Ancience company, then to be bold to examine the company of maritings. Which scrupulate the foregoing bath ingendred infinite errors in all kinds

mobiledge, and in all civill administration, of in every kind of Art. But thefe learned nen did not mean any other thing by this queion, then to find fuch numbers as should te the fame proportion tegether, as those mbers in the question proportioned did reme to another : which thing you thall methe more plainly by another question of that is this.

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CS II

Aman lying upon his death-bed, bequeathed A question goods (which were Worth 3600 Crownes) in ment. fort. Because his Wife was great with child, he yet uncertaine whether the Child were me or female, he made his bequest conditional-Inthat if the Wife bare a Daughter, then should wife have halfe his goods, and the Danghter the if she were delivered of a Sonne, then that Some Bould have; of the goods, and his Wife by Now it chanced her to bring forth both a and a Daughter; the question is: How laber part the goods agreeably to the Testawho Will?

Scholar, It some cunning Lawyers had this liter in scanning, they would determine Testament to be quite boide, and so the to die intestate, because the Testament made insufficient, sith this condition not expressed in it, and also it might babe ted that thee thould have brought torth er Sonne noz Daughter, as often bath bin is to to the Will insufficient to that point

Mafter. Such Scanners thould feem too coming, and get not so counting as cruell: for the minde of the Testator is to be taken sabourable for the aide of the Ligatories, when there are seth such doubt. But let us try this work, not by force of Law, but by proportion Green metricall, seeing the Testator did mind to perfect to each fort of them.

Scholar. If the Sonne thall have; by the of the Testament, so must the Mother have; Againe because the hath a Daughter also, there so by the to have; and the Daughter, that is both wayes; and the Daughter, that is both wayes; and the comment

TH berefoze it feemeth also impossible,

to the whole goods, and; moze.

Scholar. I pray you Str, how Wall I

out these numbers?

Mafter. That will 3 gladly tell gon.

What

What foever the proportion be of any three To find 3 bers, multiply the Tearms of that propor- numbers be together, and the number that amounteth in any proall be the middle number of the three : then portion. Hiply that middle number by the leffer mand divide that total by the greater, and least number of the three will amount: So multiply that middle number by the derextreame, and divide the totall by the ferextreame, then will the greatest number that Progression amount.

the pro-

What

scholar. Then in this example to find the To find the proportion of to; 3 must divide (as you the proportion in the division) to by; and the quoti-portion mobili be 3, that is, 13, whereby 3 perceibe between the proportion in this question, is as two num-Therefore as you taught mee eben bers. as, 3 multiply 3 by 2, and the fumme ts (mich muft be the middle number : then 3 the middle number 6 by 2, which the least tearme, and the summe is 12, that othine by 3, being the greater tearme, mhe quotient is 4 : lo is 4 the leaft numwof the three. Then 3 multiply 6 by 3, Mitteof commeth 18, and that I divide by 2, the three.

Mifter. Another way pet may you finde ethird number in any Progression, if you two of them : for if the middle number the of them which you have, then multi-

A 8 4

plp

ply it by it selse (as in their example, 6 by 6, maketh 36) and that totall divide by the ther number which you have, and the thin number will be the quotient.

scholar. Then I divide 36 (which commeth of 6 multiplyed by it selfe) by 4, the quotient will be 9; and if I divide 36 by 9, the quotient will be 4. But what if I know the first number and the third, and would have be middle number?

Master. Multiply the two numbers together, and in their totall you must seek the root of that number, and it shall be the middlenumber: but because as yet you have not leave to extract Roots, therefore use the first some which I have taught you, till I teach you extract Roots. And now goe forwards will the answer of the same question that I want

must not babe; of the goods, neither the line ther; no; pet the Daughter; but pet must be goods be divided into such Proportional the Sonne shall have a Crowner so; but Mother, and the Mother shall have a Crown so; every 4 to per Daughter. Then I applied to the Golden Rule in three examples, while loweth.

those the first number is the Additions those three numbers 9, 6, 4: and the third one of them severally: the second is the fact of the goods in that Testament: and in

Note.

		4
whe morke of the	3600	
Golden Rule, 3 find	9 -	
the fourth num-	16 7 3600	
ler in every worke:	6	
mis for the Sonne	19 Z 3600	
1705 15 for the Mo-	4 4	
m 1136 130 and for	table to the	
Daughter 757 17:	Three is condi-	
which fummes	1705 7	
now together, doe	113615	
mie the fumme of	75717	
he whole goods, as	3600	

cample. ind this (mee thinketh) I doe perceibe. nie in this case there is a necessary redebifed agains an orgent inconver therefore those learned men though might ale the like liberty in that other

offer. Pour gheffe is good, but they had fo reason so; them in the one, as they babe the other : As in another example of theirs, p better appeare, as in this.

Aman left unto his three sonnes 7851 crowns Another be parted in Such fort, that the first Son should question the fecond Son , and the third Sonne, to of a Tellaich is not possible: for ;, and ;, and ; doe make or is that is I tis fo it is more then the whole, reduce these Fractions into one denomination, the least that they will come to, and they will

be 13.53, 15.1 and so may you part the goods in such proportion as these three numerators be together, that is, the first to have 6 for every the second, and the second to have 4 as often as third hath 3: and so their portions will be for first, 3623, 23, for the second 2415, 3, and for the third 1811; and these three shares added to ther, will make the totall summe of 3623, the whole goods, as you may easily 2415, see in this example.

Another question is there pro-

.785

Another There hike questi- three me

There are 450 crownes to be divided between three men, so that the first man must have tall the second man, and to the third man shall have the and to the second man shall have the second man shall ha

Scholar. I marbell that any man the to oberteen, to propone that question of thing possible, fith 11, 11, 15, do make 1 15 is almost bomble the whole summe.



But I perceive it might be thus proposed that as often as the first man bid receive of Crownes, so often the second man front a ceive 35, and the third man 27; for and

is equal to :: and fo is; and i equal to :: and i equal to the chief figures will appear in this form: whereby the first mans por tion is found to be 200; the second mans part is

11	+	450
50	4	200
35		450
112	7	450
274	150	108,7

to tobole both make 450 Crownes to bee

Mafter. And thus you are (I think) suffici-

The Rule of Alligation.

Rule of Alligation; which bath of Mixhis name for that by it there are ture.
his name for that by it there are ture.

divers parcels of sundry prices, of sundry quantities, alligate, bound, ixed together: whereby also it may be well his be Rule of mixture; and it hath great composition of Medicines, and also in three of Metals: and some use it hath in tures of Wines: but I wish it were less sused in then it is now adayes. The order of this titles.

then any fummes are proposed to bee The Readined, let them in order one over another, & fon of this temmon number (whereunto you will rea Rule. Rule fummes the lefter thand; then marke that fummes has lefter then that common number, and which hee greater, and with a hinght of your Penne evermore links two numbers together, so that one be lefter then

40

the common number, and the other grener then be: (for two greater, or two fmallerging not well be linked together) and the reason is this then one greater and one imaller, map be for mired, that they will make the means or common number bery well: but two lefte can neber make to many as the common nonber, being taken opverly : no moze can mo fummes greater then the mean, eber make the mean in bue order, as it thall appeare better to pour pereafter. And as this of necession linke every fmaller (once at the leaft) with one greater, and every greater with one imaller to it is at liberty to linke them offner then one and to map there be to one queltion, many lo lutions, When you babe fo linked them then marke bow much each of the leffer num bers to imaller then the meane or common number, & that Difference let againft the grater numbers, which be linked with those fmiler, each with his match fitll on the right hand, and fikewife the excelle of the greater number above the meane, pour thatt fet before the lefe numbers, which bee combined with them Then thall you (by addition) bying all this differences into one fumme, which thail beth first number in the Golden Rule, & the fecont number thall be the whole maffe that pon toll babe all those particulars : the third summe thall be each difference by it felfe, and then by them thall be found the fourth number, beth ring the just portion of every particular in

nat mixture: As now by these Examples I

There are foure sorts of wine of severall prices, A question me of pence a Gallon, another of 8 pence, the of mixing of wines, and the fourth of 15 pence of wines. It gallon. Of all these Wines would I have a mixime made to the summe of sifty gallons, and so in price of each gallon may be 9 pence. Now demand I: how much must be taken of every sort of wine?

Scholar. It it hall please you to worke the fiftexample, that I may mark the applying at to the rule of then I trust I hall be able, mionly to doe the like, but also to see the mion in the order of the work.

Mafter. Bark then this forme, and the pla-

of every kind of number in it.

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The prices the differences,

6 A 12 Z 50 12 Z 50
2 B 6 Z 25 2 Z 8;

1 C 21 Z 50 12 Z 50
3 D 1 Z 4; 3 Z 12;

Here you fee 3 have fet downe the feverall

rall prices, tobich be 6, 8, 41, 15, and bate ked together 6 with 15, and 8 with br. common price o, 3 babe let on the left fide and the difference between it, and every pani cular price, I have fet on the right hand . against the fumme (tohole vifference it is) againg the forme that is linked withall the difference of 15 above 9, is 6, tobin 1 babe let, not against is but 6, that is line with 15, and the difference between 6 and (that is 3) I have fet against 15. So likely the difference between 8 and 9, ts but 1 this babe let against II, and the differenced it above 9 (which is 2) I have let againg 8. Then abbe 3 all those foure differences. they make 12, tobich 3 fet too the first number in the Golden Rule : the fecond number] make 50, which is the summe of Gallon that I thould have, and the third fumme be very particular difference. Pow if me work by the Golden Rule: you shall be the number of Gallons that thall be the of each fort of Wine : For the better dien ation whereof, I have fet these letters, A,BCD both against the numbers for which the tool doe ferve, and over the work also, which The proof beratty ferbe for each of them. And now ! pon lift to examine the truth of these works ande thefe foure fummes together, and will make 50, that is the totall which !

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of this Rule.

والقبائلة والطاقية	control	THE REAL PROPERTY.	
- 4			5 61 4 200
	120	-	-
AJ	100	atı	OB.
121			

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pour may easily perceive.

to (to) to prove both the
fices doe agree) do this: mully the totall summe 50, by
ecommon price 9, 4 it will
the 450: then keepe that

25 8; 4; 12;

50

me by it felse, and afterward multiply eesteveral summe of Gallons, by the price
enging to the same Gallons, and if that sum
engree with this, which you have kept first,
mis your work well done. As here 25 is
number of Gallons of 6 pence price, multiply then 25 by 6, and it maketh 150, which
m shall set downe, then multiply

m thall fet downe, then multiply

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mber of Gallons, and it will 66; mie 66; so againe 4; multiply 45; abit, both make 45;. And last 187;

stall 12 multiplyed by 15, mas 450

1875: and these added together doe make in the Example annexed you may be berefore seeing it doth agree with the for some for multiplyed by 9, I must justly that this more to be good, and well done.

and now to prove how you can doe the like, I The variewound the same question, onely willing you to tion of some other forme of combining or linking the this questi-

Scholar. That that! I prove with your faire, & therefore I combine 8 with 15, and 6 lb 11,4 then the form will be as 5 followeth

			a an B	
167	2 A - 12	7 50	12	100
187	6 B 2	Z 50	6	30
\(\frac{6}{8} \) \[\frac{6}{15} \]	310		D	FRICE
115	1 D . 12	L 50	112	7 150
(3	1 - 13°	d nor	30 44
1 1 1	12	מנים וופספר	1: 07	ORIGIN.

totall of the differences as old before: and per now the differences be altered as the combination is changed, whereof I understand the reason by your former work. And therefore bere appeareth no strange thing, but that now I have & Gallons for pence, and 25 gallons of 8 200 pence, and 12 gallons and of 11 1374 pence, and so consequently 4 921 gallons and of 15 pence: so 450 that multiplying 82 by 6, it maketh 50, and then 25 multiplyed by 8 milketh 200, like wise 122 multiplyed by 11 pub

maketh 50, and then 25 multiplyed by 8miketh 200, likewise 124 multiplyed by 15 maketh 6, 137%, and 4% multiplyed by 15 maketh 6, indich 4 summes added into one, will yeel in the totall 450, which agreeth with the multiplication of 50 being the totall summed gallons) be 9 the common or mean price.

Master. Deeing you conceive this would well, I will propound another example my you of more variety in the Alligations or the binings, as thus.

A Merchant being minded to make a bargain A question bices, in a mixt maffe (that is to fay) of of Spices. Claves, Nutmegs, Saffron, Pepper, Ginger, and Almonds: the Cloves being at 6 Shillings, Saffron 10 hillings, Pepper at 3 Shillings, Ginger at

fillings, and Almonds at 1 Shilling. by would be have of each forf some, to value of 300 pound in the whole, and each wand one with another, to beare in price ? illings: Dow much thall he have of each

Scholar, That will I try thus.

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first 3 let bown thole fir feverall prices, and the left hand 3 let the common price 5 fillings. Then I linke them thus, 1 with 10, with 8, and 3 with 8 : as in the example fol-

Malter. 3 had minded to have combined In more variety: but I am content to your own work first, and then more variein combination may follow anon.

Scholar.

Scholar. Then to continue as I becan, a feeke the difference between I and 5, (White is 4) and that I let against 10; then again 1 3 let 5; which is the excelle of 10 above to 3 gather the difference between i and which is 3, and that I let againg & become it is combined with 2: and like wife the diffe. rence of 6 above 5, (which is 1.) I let aguing 2. Then take I the difference of 3 from 5, tobich is 2, and that I fet against 8 : and be fore that 3, 3 fet the difference of 8 above. which is 3. Then gather 3 all thele differences by Addition, and they make 18, which ? let toz my first number in the Golden Rule. and to appeareth by thele works, that of Almonds I must take 83 pound of Ginger 16; pound, Pepper 50 pounds, of Clove 50 pounds, of Nutmegs 335 835 pounds, and of Saffron 66; 335 pounds. 150 Then for triall hereof, 3 mul-300

tiply every parcell by his feverall price, as 83; which is the fumme of Almonds, I multiply by one which is their paice.

Also 19% the summe of Ginger, I multiply 2, which is the price of it: and so each a table kinde, as this Table annexed bottometh, and then adding them all together the total to bee 1500, which also amount by the multiplication of the gomalle of 300, by the common price 5, who

co

it appeareth well wronght.

Maker. Row I will make the alligation to be pour cumiting somewhat better: but bete you hall not thinks your felle preffed so th, I will also note the differences, as by Example you may see, where I have

Spilg and h	b nadies		A Hills	D	ig!
Agration.		33	3003	37	300
1	1.3 4	4	- 300 3 - 37 11	4	37tz
11	3.5	22	2 00 2	2	200
	4 4	8	72 iv	7	63.5
8 1/	4.37		200 30	F	1101
(10	3.2 5	33	→ 300 3 → 45 fr	37	300
UDD.	33	5	-45ir	5	45.4

limited 1 with 6 and 8, and therefore babe 3 Haminft I both their differences, that is I ma: Likewife, because 2 is combined with Im 10, 3 fet before bim their differences, 3 my Against 3 I have fet onely 5, which is differences of 10, with totom 3 iscombined Likewife 6 is onely alligate to 1, and metaze to the differences of I from 5, which comp fet againt it:8 is linked with 1 €2, prefore bath fet 4 against bim, both their ences, 4 and 3 : and 10 is joyned with 3; therefore bath be their differences, 2. And because of ease for you, in anocolumne 3 babe fet the differences redunto one number, for every feverall fort, 115 b 2 and and have also added them together, when appeareth that they make 33, and fo contiquently you fee the works of the Golden Rule let forth. For the fix Drugges 3 bave about

the letters A.B.C. ec. as before.

But I would not with you to cleave fills thele elementary aids, but accultome Memory to trust her self: io shall occasion of negligence best be avoided. And as for the proof try that more teifare, because the time now is that, and you sufficiently instructed in that puts: And there refleth others things behinderet, of which I would gladly give you some talk, before pour departure.

Scholar. But if it may please you to let me fee all the variations of this question, before pon go from it, for me thinketh 3 could vant

two or three mapes more pet.

Malter. 3 am content to fee pou maketwo or three variations : but 3 would bee louble stap to fee all the variations, for it may have ried above 300 wapes, although many of the would not well ferve to this purpofe.

Scholar. I thought it imposible to make

many variations.

Mafter. Marbell not thereat, for fome que ftions of this Rule, map be varied above 1000 wayes, but I would have you forget fuch talies till a time of more leifure. Andmi go forward with some variation of this que stion.

Scholar, 301 the first variation, 3 lie

Note.

Note.

inc with 9 and 10: then joyne I 3 with 6,8, and 10, as in this forme.

TO LA	1.				1 19 19 1
1	C 8		A		D
	Coi .	43	7300	43	7 300
7 1	35	8 8	553	5 54	300 3438 E
1	12	6	В		E
U X	135	9 43	300	9 43	300 4137 F
le X	132	6	C 414	3	F 4133
10 /	432	9 43	-	435	7 200
43 6	A.C.	43 9	623	: 94	Z 309 2634
11000		7	. 1		7.

and to doth there appears the proportion of weight to; every kinds of Drugge in this

minure. Row for the triall.

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pen Far:

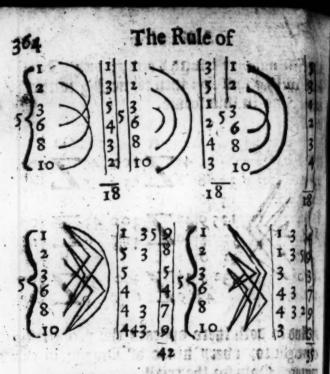
das

1000

sqr. another and

Malter, Ray stay there: you shall not need to the trials in one example so often, or if well to be it by your self, I am content. But now set forth (for declaration that you contain the Rule) two or three examples of several Combinations, and then will we passe where other example, and so end this Rule.

Abolit. As it pleaseth you, so will I doe:



combinations are severall, so both it plaining pear, that the differences by which there portion of each severall kinds is taken and seperall. And pet I see in the three first dividing five varieties, and in the one other before the tall summe of the differences to be one. We to say, 18, whereby I perceive that the way of their mixture both depend on the varieties differences severall, and not of the most of their totall summe.

Master. So is it. And seeing you consist so well, I will make an end of this Rust onely exhibiting unto you one Question two of the mixture of Metals, that by it may devise others like, and exercise your literein also, because the use of it serveth of

minimeste of charge not so much so? Goldminister of coynage in Mints. First, I demin of you this question; if a Mint-Master we Gold of 22 Kareets, and some of 23 Kanu, some of 24: Againe, some 15, some 16, and so of 18 Kareets, and would mix them, so that unight have 100 ounces of 20 Kareets: How whomust he take of each sort?

Scholar. Io know that, I answer in order

or 15	2 20	100 2	0 77	CO
m dem	3 2 2	10	1 2	5
102 18 X	4 20 7	100 20	71	00
1 23 11	3 4	15	12	0
1 (141)	20 3 2	100 20	71	00
Narects unti	20.3	·10 24	-1	0

Mister. Don have wrought the question ellibut bow chanced you made no doubt of thew name Karect?

sholar. Because I thought it out of time meand such questions now, seeing you without bast to end: and agains in this the proportion of the number is sufficient up purpose in this works, trasting that westime you will instruct mee as well of a sof sanday other things, which as I be beard you talke of, so I have a great design to them.

Master. Pour answer is reasonable, and request and trust (with Gods helpe)

on I

I intent to latistic. And now to goe to four with this matter, let me fee your examination of this last worke.

Scholar. Fift to, the one part and together all the particular fummes, as they appeare in the work, and they make 100, as here by their Addition both appeare.

And to it feemeth that the fums are well gathered: but for the further triall of them. I multiply

120 first 20 which is the common or 240 means summe of the Kareers by 100,

360 tohich is the fum of the whole Male,

550 which I would have, and it main 460 2000. When I maltiply cherypi-

240 ticular summe by the Karects that

2000 maketha pol 109

Likewise I multiply 13 by 15, and send eth 240: so 20 by 18, makes 360. My 22, peeldeth 550: likewise 20 by 23, hu eth forth 460; and last of all, 10 multiply 24, peeldeth 240: which summes all put sogether make 2000, that dosh agree will like summe before, wherefore I may well that the worke is good. And now (if it puyon) I would set forth some varieties of question to prove my wit.

Mafter. Go to, let me fee.

Scholar. Bere be foure varieties

the most pet could I make, but not like to mumber that you speake of in the variation.

Wifter. That will I teach you at more lefto feeing it is a thing rather of pleasure then

priecellity.

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elle, seth parnt ti

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But now for your exercise in this Rule, one o- A question in question I will propose. A Mint-master hath of mixing a Ingots of silver, of sundry sinenesses, some of silver. In and other of sight, some of II, and other of in, and his desire is to mixe 500 pounds weight, that in the whole masse every pound weight hould be are nine ounces of fine silver: How much like take (say you) of every sort of silver?

Scholar.

Scholar. To finde out that. I fet the numbers thus in 03: Det.

And gathering the differences it will ap pear, that of the fire fort there must bee 43 is of the fecond



like much : of the third fort of 1 and of the fourth fore as much: of the fife fort 198 1 and of the fixt fort 86 22 which in the whole will make 500 pound weight, and in ounces after 9 ounces fine 4500, that is of the fielt for 173 and of the fecond fort 217 3, of the third fort 391 7, of the fourth fort 521 17, of thefit fort 21524 and of the fixt fort, 1045 " with all together so make 4 500 ounces agree the multiplication of o by 500 this

Mafter. This is well bone of pon, now make three or foure varieties, and

end of this Rule.

Scholar. Thele foure varieties ample

F40 0	and 43	1.3	(4	23 2 2 2 543 141 5
5 tou	NA 13	3	15 1	20 3
9500	1 1 33	30	38	1 3
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Trioniz:	March & Comment			Milten

Maker. And by their it appearet', that you make and out more, with hobits I will not now walt, who energy (for to form you an easie metopologing the lines of combination) I will let forth two varieties here.

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And this shall suffice now to the Rule of Alligation or mixture: for by these examples my you easily consecure such other as to appearing to it, as well for the me working, to variety of drawing the lines of Combination.

Scholar. Sir, albeit it pleased you erebale to put mee from my muling at the many unctics that may fall in these Combinations,

and

and termed them phantalies, yet my phantale giveth mee, that the confideration of this should in many other examples and tales of importance be very needfull, and the know, ledge of it most profitable: Therefore ye may well think, that aranother time convenient I will request you to aid me berein.

Master. Truth it is, that this consideration may fall in practice as well Policickas Philosophicall, and sunday mayes in them be applied. Therefore when time that fall sit, sor the off colling of this consideration, you shall not be consideration.

my belping hand.

The Rule of Falshood

The occation of the name.



owwill I briefly also teaching somewhatof the Rule of Filk-hood, which beareth his nam, not for that it teacheth in fraud or falshood, but for the

by falle numbers taken at all adventures, it tenteth how to finde those true numbers you feekel.

Scholar. So might any other Rule becall, the Rule of Fallhood, for they worke by wing numbers, and by them finde out the right numbers sto both the Rule of Alligation, the Rule of Fellowship, and the Golden Rule partly.

Mafter. In the Golden Rule, the Rules

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rellowship, and the Rule of Alligation, altempt the numbers that you worke by be not the true numbers that you seek for yet are they numbers in just proportion, and are found by the light worke, whereas in this Rule the number are not taken in any proportion, nor that by orderly worke, but taken at all abminres.

And therefore I sometimes being merry with my friends, and takking of such questions, wall unto them such children or idioes, as build to be in the place, and so take their answer, declaring that I would make them solve the questions, that seemed so doubtfull.

and indeed 3 did answer to the question, mo booke the triall thereofals by those answer to the the trial thereofals by those answers which numbers seeing they be taken as manifest salle, therefore is this Rule called the Rule of salse Positions, and sor briefnesse, the Rule of Falshood: which Rule sor readings of remembrance, 3 have comprised in the sew verses sollowing, in some of an objure Riddle.

Marie.

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Shesse at this work as hap doth lead,

By chance to truth you may proceed,

And first work by the question,

Although no truth therein be done.

Such falshood is so good a ground,

That truth by it will soon be found.

From

From many bate too many moe,
From many bate too many moe,
With too much joyn too few again:
To too few adde too many plain.
In crosse wife multiply contrary kinde,
And all trush by fallhood for to finde.

The lense of these Verses, and the same of this Rule is this.

The expofition of the Rule. When any question is proposed appertaining to this Rile, first imagine any number that you list, which you shall name the first position, and put it in stead of the some number, and the worke with it as the question imported unlike you have missed, then is the last number of the worke either too great or too listle: that she you note as hereafter shall be taught you, at you shall call it the first errour.

Then begin againe, and take another which stall bee called the second pulsus and worke by the question: if you have mile againe, note the excelle or default as it is, not call that the second errour. Then multiply crosse-wise the first position by the second was and againe the second position by the first entrand note their totalls severally by the named totalls: Then marke whether the two error were both alike, that is to say, both too mile or both too little: or whether they be anise that is, the one too much; and the other

me for if they bee like, then thall you fubof the one total from the other (I meane the or Dividend : To must you abate the leffer out of the greater, and the relidue shall the Divisor. Now divide the Dividend by doifor, and the quotient will shew you rue number that you seeke for. But, and if errours be unlike, then must you adde both of totalls (which you noted) together, and de that whole number for the dividend, to that adde both errours together, and that whole ber shall be the Divisor, and the quotient of Division shall give you the true number at the question feeketh for, and this is the mole Rule.

Molar. This Rule feemeth fo milike any that without fome example 3 thall not

alle understand it.

Mater. With a good will : propose halfe a materiory questions and examples of variele in the better understanding of the worke med: and for the first, take this example. A A question Majon was bound to build a walt in 40 dayes, and of Majontrue covenanted fo with bim, that every day ry the first the wrought, he should have for his wages 2 illings 1 penny, and every day that he wrought he fould be amerced 2 shillings fix pence, fo when the wall was made, and the reckoning of the dayes that he wronght, and of the othat he wrought not, the Mason had clearly five shillings five pence for the worke. Now

doe I demand how many dayes did bee works those 40 and how many did he not worke?

Scholar. I pray you expresse the or the worke, that I may partly by times and partly by comparing it with the Rule. able again to bo the like.

Malter. This oader thall you keepe to mork of this Rule : First take fome number (as you lift) at abbenture : as for example fag be played 12 dayes, and wrought 28 da Row cast you the wages of every day, and he whether it wil agree with the lumme of the lings 5 pence.

Scholar. The 28 dayes that he wronght after 25 pence the day, peelbeth 700 pence! Then 12 dayes that be wrought not at 30 pence each day, both amount to 360 pence, which if I abate out of 700 pence, therereles

340: but you fap be had not fo much.

Malter. De bad but 65 pence, and bythis supposition be would have bad 340: there we to this fumme too much by 275, which winner I must let downe after this lost as you fee here, where first I have made a croffe (commonly called S. Andrews croffe and at the over corner on the left hand 275T I have let the first polition 12: and at other comer under it I have let 275, which the first errour, with this figure t, which tokeneth too much, as this linewithout a croffe line betokeneth too little.

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the right hand of the crosse I have left two a roomes for the second position and his erms. Therefore to prosecute the worke, I supply played 16 dayes, and wrought 24.

scholar. I was a while in doubt why you med the dayes of his working, seeing they not let in the figure: and I doubted how while them, or else whether that you did not them at all adventures, as you did not dives that he played: but now I gather, the dayes that he played being supposed, and the dayes that he played being supposed, wrest of 40 must needs be the dayes that her mught, and therefore 28 followed 12 of neutral learner as well 28 as 12.

Master. It sozceth not which of them I take, so that in the second position I take the numbers of the same nature that is here both it working dayes, or both of idle, but now er-

tome pour this fecond polition.

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ici ii ch io plam e. Scholar. If he played 16 dayes, then abaing is times 30 pence, the sum will be 480
me, and for 24 dayes that he wrought, every
difference, and for 25 pence, the total is 600 pence,
that abating 480 out of 600, there resteth
mo, and as you say, it should be but 65: thereis it is too much by 55: that must be set on
right hand of the figure, at the neather part,
moder it on the same side 16, which is the
mond position, thus.

And

12 16 X

And as I gather by your words, it were mone if I did fet 28 in tread of 12, and 24 in tread of 16.

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Mafter, So were it. But this thall pe marke, that, of what nature foeber the fin politions bee, of the fame nature tis be quorient. I berefore when the politions in this one ftion are 12 and 16 which both being number of the playing dayes, the quotient thall bedere the true number of playing dayes : whereas if the politions had been 28 and 24 lubithers Supposed to bee the working dayes, then be the Quotient Declare the true number of the working dayes, and not of playing dayes att will be now. And therefore to continue the work of this question, and to finde the me number of playing dayes, 3 must multib croffe-intle the first position by 55, that is the fecond errour, and the totall will bet 660. Then I multiply 275 and 16, and it peels 4400. Row becanfe the errors are alike the to fay, both too much, 3 must fubtrad & out of 4400, and fo remaineth 3740, inhigh the dividend, Againe, I must subtract the fer errour 55 out of 275, that to the great errour, and there will remaine 220, to will bee the divisor : then ofbiding 374 220, the quotient will bee 17. Wiberefor fay noto constantly that 17 is the true number of dayes that the Mason played : and the followeth that he wrought 23 dayes: Al is the question answered.

Now for the order of triall of this worke, there The proof th none other trial but onely this, to worke of this rule obrhis number according to the question, and if wee, then appearetb the number to bee it that would have

nd here noin feeing he wrought 23 dayes, must have for every day 25 pence, the ole fumme commeth to 757. Then againe, eing bee played 17 dayes, and mut abate 20 ence for every day, the whole fumme of the element will be 510: Therefore I labtrac mont of 575, and there will remaine 65. maketh & fhillings, & pence, the cleere per of the Malon, for his worke, according

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sholar. Rom I frut I understand the he and the Rule to well, (and the better by proofe) that I can be able to doe the like: let a proof, I take the same question, all e last number, where I will suppose that to thillings to; his wages cleere. And ghelle at the number of the dayes bee whi. I coppose, first that he wrought 20 then lap 3, if he wrought 20 dayes, his smust be good. then bid be play other ives, for tobich mud be abated 600 d. and bee loseth 100 d. And so am 3 at a stap, is not like to your to mer most.

liker. Don Mould babe required of mee question, and not have taken a question of owne phantalying, untill pou were more et in this Art, for fo might pours mell

bap.

And now (03 the rest goe 200

gaine.

Scholar. As my errour hath uttered a folly, so it hath procured me better und

Standing.

Pow therefore confidering this points not to folve the question, I take another, a poling that he incought 30 dayes. Then his wages he must be allowed 750 pence, to the 10 dayes which he wrought not, must abate 300 pence, and so remaineth day o pence, but it should be onely 120 per therefore it is roo much by 330, which it bowns in the figure with the sommer poling and his errour, and the figure appeareth to

Row first, I multiply in cross wayes 20 by 330, and 20 it will be 6000.

Then againe I multiply
30 by 220, and it will be als 22010 6600. Therefore if I
Wall subtract the one out of the other.

per

Maker. In this you forget your felte again; in as much as the fignes in the errours be the therefore must you worke by Addition, and together those two totalls to make the idend, and also adding the two errours to the Divisor. And because you thall no more this part of that Rule, take this

And like desire Subtraction.

feremembaanee.

Scholar. Pou meane, that if the errours telke signes, then must the Dividend, and Divisor be made by Subtraction, as is not before: And if those signes bee unlike an this last example they bee) then must I addition gather the Dividend and the Dividend and the Dividend and the Dividend and the Dividend Education agains I adde 220 to 330, and it will be 13200, which will be the Dividend Then agains I adde 220 to 330, and it will 550, which must be the Divisor: whereas this ding 13200 by 550, the quotient will hereby I know that the Mason aight 24 dayes, and then it followed, that haved 16 dayes.

Miller. Examine your works, whether it

scholar. For 24 dayes worke, the wages the 600 pence, and for 16 dayes which Mason wrought not, there must be abated upence, and then remaineth cleare to the

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Mason

Major 120, as the question importers: where

dayes that he wrought.

Master. Although you seems now to unback and this works, yet to acquaint your mine the batter with the new Crade of this Rule, thinks it good to propone to you 5 03, 6 examples more before I make an end of it.

Scholar. Sir, I thanke you that you be he consider my commonity and profit in kind-ledge, for undoubtedly it is practice and exercise that maketh men prompt and expense.

very kinde of knowledge.

Master. Pon say well, so that they tolk some certains precepts to governs and the their practice by, else may practice prome custome of errour, and a repugnance to the neite of knowledge: namely, as long as the error is not plainly known to the bulgar by. But to returns to pour work.

A question of wares, the second example, There is a servant that both bought of Villa and Damask for his master 40 jurds, the Volut at 10 shillings a yard, and the Damask with shillings, and when hee commeth home, his Master demandeth of him, bow much he hath both of each sort: I cannot tell (saith hee) exists but this I know, that I paid for Damask 48 lillings more then I paid for Velvet: now millings more then I paid for Velvet: now many jurds there is of each sort.

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Scholar. Although the ghette feemething fault, pet I will prove what I can bet I temember your faying, that it forcells

on fond of falle the ghesse bee, so it bee someact to the question, and not an answer of a

strary matter.

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cherefore first 3 imagine that be bought 20 ls of Damask, for which bee thould pap afthe former price 240 shillings : then must needs babe of Velvet other 20 yards, (to theup the 40 yards) and that would colt 400 allings. So that the totall of the price of the Dimask is leffe then the fumme paid for Velet 160 shillings, and Chould bee more by 48. Therefore the first errour is 208, too little. then begin I againe, and suppose be bought Damask 30 yards, that cost 360 shillings, of 200 shillings : and now the patce of the Dimask is greater then the price of the Velvet bp 160 shillings, and hould bee but therefore is the second errour 112 too mich, tobich 3 fet in forme of figures, as bere

mitply in cross wayes solby 30, and the summe bill be 6240. Also I mul-

208- 112†

Incoment 2240. And in as much as the Ignesofthe errours be unlike, I know I must booke by Addition, therefore adde I these two totalls together, and they make 8480, which is the Dividend: then adde I also the two errours together, 208, and 112, and they make 320, twoich is the Divisor: twherefore

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phillings the yard. How lubtract 270 out of 318, and there will remaine 48, which is the true fumme of yards of Damask that be bought, and in velvet 13 yards; and that appeareth by examination, thus :26; yards of Damak at 12 shillings the yard, maketh 318 shillings: then in Velvet he had but 13 yards and ;, and cost 270 shillings, at 20 shillings the yard. How subtract 270 out of 318, and there will remaine 48, which is the number of shillings that the Damask bid to the moze then the Velvet.

Master. Pow thall you have a question of another kinde.

A question of debt, the third example.

There are three men that do owe money tom, and I have forgotten what the totall summer, and what the particulars be.

Scholar. Why, then it is impossible to

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know the debt.

Master. Beace, you are too hasty, thereis more below in it then yet you see. I have the severall notes, whereby it appeareth that Indiconferre their debts together, and sound the debt of the first and the second to amount to 4 pound, the debt of the first man and the third man did make 71 pound, and the second man his debt with the third, did rise to 88 pound flow can you tell what every man did on, and what was the whole summe?

Scholar. Pay, in good faith: but as I proceed that it must bee found by conjectured will I ghesse at it, supposing that the first mind of owe 20 pound, and the second man 30,000 the third——. Master

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Master. Nay stay there, you are too farre one already : pou map not suppose a seberall. mme for every man, for it to enough to fap. ofe one fumme to; the first man, and let the her rifeas the question importeth. There. efeeing pou fet the first man bis debr to bee pound, the second man cannot owe 30 ound, for the declaration is, that their debrs med together did make 47 pound, so must bescond man bis debt bee but 27 poundsow the fecond debt with the third, must mke 88 : therefore fabtract 27 out of 88, and here will remaine 61, as the third man his when Then fatth the declaration, that the first third mans debts to make 71 : but by this appolition they make 81, that is 10 too much, wich 3 must fet for the first errour. Pow tinke pon the second position.

Scholar. I suppose the first mans debt to be spound : then must the second mans debt (by your declaration) be but 23 pound, feeing bot thep make but 47 pound. And the fecond man his debt with the third. Doe make 88 pound, and the fecond man oweth but 23: brefoze the third man must owe 65 pound. And the shird mans debt with the first, full make by the declaration 71 pound, and to boe make 89 pound, that is 18 pound much, and that is the fecond errour, Mich 3 fet downe with the first, and their Mitions in this forme, and then I doe multhe in crosse wayes 20 by 18, and it is 360. and

And 10 by 24 maketh 240. 10

Also because the signes of the errours be like, I must work by subtraction: there 10† 18† some I subtract 240 out of 360, and theremeter 120, which is the Dividend: then will subtract 10 out of 18 by the same reason, and is the Divisor 8, which is sound 15 times in 120: therefore I say that the first man blowe 15 li. and then the second man must owe 32 li. sort those two do make 47 li. and the third man debt is 562 sort so much remaineth if I wan 15 out of 71, 02 if I take 32 out of 88.

The fourth example.

Master. For the fourth example, take this easing question for the variety in work. Two men having severall summes, which I know not, doe that talk together: the first saith to the second, if you give me 2 shillings of your money, then shall I have three times so much money as you. The said man answereth: It were more reason that in summes were made equall, and so will it bely made mee 3 shillings of your money. Now gust what each of them had.

Note.

Scholar. I imagine that the first had 9 s

Master. Tonsider evermore in your implement on that you take a likely summe, as into question, take such a summe, that having a ded unto it, may bee divided into three part even.

Scholar. Why? I remember you fall fore, it forceth not bow fondly foever! ghessed.

Mafter.

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dual

Matter. As for the possibility of the folurithe truth: but for easinesse in worke, the tell numbers are most convenient.

Scholar. I thought no lelle, and therefore I the 9 as an apt number to bee parted into use: but I perceive I should have considered aptacked of that partition after the additional two unto it, and then 7 had been more

Master. That is truth, and then thould the food man his summe be 5: so2 although be about the third part of 9, that is 3, yet to must remember that he lent the first man and so had be 5.

scholar. Then to go forward: if the second am had three of the first man, then should bee we 8 and the first man but 4; so bath he double the first man, yet be said in the question he should have equall: wherefore it appears that he bath 4 roo much.

Cherefore I note that error with his suppotion, a ghelle again that he hath 10 shillings: whereunto I adde 2 shillings borrowed of the kood man, and then he hath 12s: so the setend man hath remaining but 4, whereunto 11 adde the 2 that he tent to the first man, so the but 6s. at the beginning.

Then take 3 s. from the first man, and give the second, then bath the 7 10 all man but 7, and the se-

tond bath 9, which are not small, but there are 2 too

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many, inherefore I fet downe both the politions with their errours, as before pou fee, and multiply a croffe, to commeth there 40 and rate and because the fignes bee like, I take 14 out of 40, and fo refleth 26 to be bibibed a then likewife I take 2 out of 4, and there reffeth 2, by which 3 bivide 26, and the quotient will be 12, which is the fumme that the first man bab. And fo appeareth that 2 being aden thereto, the fumme will be 15, fo bath the fecond man but 5, and before be had 7 : then take ; from the first, and put to his 7, amin have each of them 10, and that is equal as the question trould.

The fifth example: a queition of Lambs.

Mafter, For the fift example, take this quelion. One man faid to another, I think you had this year two thousand Lambs : so had I faid the ther; but what with paying the tythe of them, and then the severall losses, they are much abased: for at one time I loft halfe as many as I have son left, and at another time the third part of some ny, and the third time fo many. Now que fe you how many are left.

Scholar, Because here is mention maded certaine parts, 3 must take a number that may babe all these parts, that is to fap, : am which will be 24, bowbeit 12 bath the fam parts. Therefore 3 take fire 12 to bee the number that doth remaine, fo bath be loft 64 and 3, that is 13, and the whole 23, but it thould

be 2000.

Mafter. De are deceibed pet Will pou habe for

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proceed the 10 part, which must be defalked, and is 200, so there remaineth but 1800, and up go on again.

Scholar. Then to finde the errour. I take out of 1800, and there remaineth 1775 week, which I fet to: the errour. Then for the fecond Polition I take 24, whole halfe is a the third part 8, and the quarter 8, whereby with 50, which is too little by 1750, therefore I let downe both the politions, with their errous, thus:

and multiply in crotic larges 1773 by 24, inheres frommeth 42600. Also I multiply 1750 by 12, and

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miliply 1750 by 12, and 1775

manufe the fignes are like; I doe subtract the mitrom the other, and so remaineth the Dividend 616000. Then doe I subtract 1750 pat of 1775, and there resteth 25, by which I will e 21600, and the quotient is 864, where of the halfe is 432, and the third part is 288, the quarter is 216; which all being added together, will make 1800. And if you 864 and thereto the tenth subtch was a- 432 lated before, then will the whole 288 summe be 2000.

And now doth there come a quetion to my memory which was demanded of me, but I was not able to answer to trand now me thinketh I could folve it.

Mafter. Proponeyour question.

Scholar.

A question of theep and tillage, the fixth example.

Scholar. There is supposed a Law made, that (for furthering of tillage) every man that dot keep sheep, shall for every ten sheep, ear and som one Agre of ground: and for his allowance in sheep pasture, there is appointed for every four sheep one Acre of pasture. Now is there arish Sheep master which bath 7000 Acres of ground, and would gladly keep as many as hee might by that Statute I demand how many sheep Shall he keep?

Master. Answer to the question pour self

Scholar. First, I suppose bee may been Pasture after the rate of foure sheepe tam Acre, 125 Acres, and in Arable ground 50 Acres, that is, 175 in all: but this erfort too little by 6825. Aberefore I ghelle again that he may keepe 1000 theepe, that is in p flure 250 Acres, and in tillage 100 Acres which make 350, that is too little by 600 Both these errours with their positions, die downe as you fee, and multiply them will 6825 by 1000, and if 500 1000 maketh 6825000, allo 3 multiply 66650 by soo, and there commeth. 6825

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2325000, which fumme

I fabtract out of the former, and there remain neth 3,500000 for the Dividend! likewill Subtract the lesser errour out of the greater and there refleth 175, by tobich 3 bloom 3500000 (the Dividend storelato)

e quotient will be 20000, to that by this rate that bath 700 Acres of ground, map beene 10000 Theep.

Mafter. Don babe done well, notwithfand. Another both this last question, and the next before way of ht be wrought without the second positi- working. the Rule of Proportion, as this : Wilhen is question pon found in the first errour to 500 sheep there

the 175 Acres, then at you reduce it to 7000

Golden Rule, thus:

firs Acres Will admit in allowance 500 lan, then 7000 will have 2000. And fo by one whim, with the help of the Golden Rule, may you gertbut question.

Likewife for the question of Lambs, when palad found that 12 came of 25, you might in let the figure as followeth, and babe

If 25 do leave but 12, what shall 1800 leave ? 1800 - 864. and it would appear to be 864.

Scholar. Sir, I thanke pou for this aid, hit both much Coaten the worke of this

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Mafter. Det againe, I will them pon an Another by map to ansmer to this last question with. the Rule of false position, and that by Rule of Fellowship, for it appearsty in Reponing of the question, that ten sheepe muŒ

must bave in pasture two Acres and fand to them must there be eared but one Acre; to stand followeth, that so, 2 Acres eared, there must be 5 set to pasture: and if you put them bost into one summe, they will make 7. Therefore look what proportion 7 being this totall, both bear to 5 and to 2, such proportion shall any totall in this question bear to the pasture

ground, and the eared ground.

Scholar. This ferbeth wondzous apply Therefore to probe it, I demand this wife former supposition: 3fa man babe 300 Acres both much thall be leave in pasture, and both much thatt be turne to cillage ? Dou fag, that as 7 is to 5, fo thall 300 be to the Acres of pafture : and as 7 ts to 2, fo is 300 to the Ame of tillage: tobereof for both 3 babe fet eximples here following, whereby appeareth that of Pafture, there thall bee 214 300 211 Acres, and of Tillage 85 5, which both fummes added together Doe make 300 28% 300.

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Another question, the seventh example.

Master. Now take another Example: And buth three silver Cups with one Cover, the Commeigheth 18 ounces, the second cup weighether halfe the weight of the first and the third. Not the cover be put to the first Cup, they weigh just much as all the shree Cups do weigh: and sto cover be joyned with the second cup, they were much as the second twice, and the third and in Comments.

over be put to the Cup, they will make twice as uch as the first and second Cup. Now try you hat was the just weight of every Cup.

Scholar. I Doe fet the weight of the firft on to be nine ounces, then thas much as thele that to to lap, the cover and the first (a) do weight the weight of the three Cups, The that the three Cups must weigh 27 onces, for fo much is 18 and 9. Also becante fefift and the third do weigh double formuch ithe fecond, therefore it is the third part of but weight, that is 9, and then would it folthat the third Cup also should weigh 9 ounces; but then the question satth, that the Cover being joyned to the second Cup, they mighas much as the second twice, and the third once, that Could bee 27, and so it doth; the being joyned with the third Cup, they hold weigh twice as much as the first and the frond, that Mould bee 36, and they weigh but 7, his that error o too little. Then begin I againe, and fag, that the first Cup doth weigh twelve ounces which I joyne with the lover, and thep make thirty ounces ; then feethe fecond is of that weight; it must needs righten ounces, and the third must weigh 8 nces, feeing the first and the third must high 20 ounces. Row put I the Cover to the cond Cup, and they weigh 28 ounces, which with be even fo: then joyne I the Cover with a third Cup, and so would it weigh twice the and the fecond, that is 44 ounces, and they D D weigh Con in west

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ineight but 26, that is 18 too 9 12 little : those errours with their politions 3 fet downe, and multiply in croffe-wayes 9g bp ra, whereof commeth

108: Allo 9 by 18, and that peeldeth 162: and in as much as the fignes bee like, 3 abate the leffer out of the greater, and there bothremaine 54. Then Doe 3 allo abate the lefferer. rour from the greater, and fo remaineth g, by which 3 divide 54, and the quotient is 6. which I take for the true weight of the first Cup, which being joyned with the Cober, mut weigh as much as the three Tups, fo bee ther weigh but 24 ounces. Then feeling the fecond Cup is the third part of that weight, for the other two Caps (you say) must weigh double his weight, the weight of the fecond Cap is 8 onnces, and so the weight of the third cop mult be ten ounces. Pow put the Court the fecond Cup, and it will make 26 ounces: that must be the weight of the second twin, and the third once, that to, twice 8, and mu 10, and fo is it. Again, put the Cober to the third Cup of 10 ounces, and they must bely twice as much as the first, and the fecond, in ts, 28, and to to all agreeable.

Mafter. Then answer to this Dueftion

A question of water: the eight example.

There is a Cifterne with foure Cocks, come ning 72 burrels of water: and if the great Cocke be opened, the water will avoid cleans Ax houres; at the second Cock it will asked

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bever at the third Cock it will avoid in no to fe mening bourges; and at the madeft it will reive twelve boures Now I demand in what space will avoid, all the Cocks being fer open ? 1991

Scholar, Firtt, I imagine it will aboto in

the boures.

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Mafter. Than muft there aboid by the first och of the inater, that is 24 Barrels, and in the fecond Cock & that is 18, and by the bin Cock ; that is 16 Barrels, and by the milest Cock - that is 12 Barrels, all which immes put together, do make 70, as by their Addition it both appear, but it thould be 72 54 terefore the error to too felo.

Scholar. Then will 3 begin 24 min by your favour, because 3 18 toke I understand the work, 18 but three boures for the due 12 meto Chall there run out at the matell Cock sthat is 36 Bare 70 wis and at the fecond hole !.

had is 27, and at the third Cock i, that is 14, and at the smallest hole to that is 18 Ware tis, which all together do make 105, and bould bee but 72, fo is it too much by 32: malore dee I fet the errours in order of the ture with their positions,

m morke by Pultiplica. tion, in croffe, faying, tivo times 3 to 6, and two times

time the fignes are unlike, tilda?

ED D 2

I muft abbe thele two totalls together, which make 72 : alfo 3 abbe the two errors, and then make 35, by which I divide 72, and the Quotient rifeth ; whereby I fee that all the Cocks being let open, the water will aboid in two houres, and st of an houre.

Mafter. Abis epercife maketh pou to grow expert in the Rule. Therefore 3 will more you lomewhat moze with a question or two.

A question of partners.

example.

There were two men that had been partners, and had in account betweene them 300 Duckers; Whereof the one should have for his part 180, and the other 120; but in the parting of them, they The ninth fell at variance, so that each of them catched a many as he could: yet afterward being reconciled they agreed that he which had gotten mof part of them, Should lay downe tof them aggine, and he that had gotten least, should lay down of those which he had taken, and then parting the into two equall parts, each man to have halfe thereof, and so had they their just portioni, " they ought : now I demand of you, what each of them had gotten by the scambling?

Scholar: I suppose bee that hab least, mi 108 Duckets, then the other had 192: where fore in laying downe againe of the 192, that was put downe !, that is, 144, and so have left but 48. Also of the 168 there was lan downe 36, that is ; and to be had left ?. Then I pir together 144 and 36, and it keth 180, which I part into two parts com and fo commetheo to be given to each of the

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which summe put to 72 maketh 12, and top. to 148, it maketh 238: and now 3 doubt win I hall go forward. ni san amino dista

Malter. Don need not to take but one of Note. hem, which you lift, the greater of the smalfor all commeth to one purpose ; and so pou compare it that you take to any of the ther fummes, remembring that you make ampartion to the fame in the fecond worke: sfor example of the first part. If pou com. mere 138 with the leffer fumme bue, that is no. fo to it 18 too much; and if pon compare thith the greater fumme, then is it 42 too little. Again, if pon compare 162 to the greaterfumme, the error will be 18, as it was in mother : but it will have a contrary figne : to if pou compare it with the leffer fumme. #will be 42 too much : fo that the error both buyes is either 18,02 42: and as for the fignes filttle forceth, for in them is nothing confibend here, but likeneffe and unlikeneffe, wbich inhis case both neither further or hinder: But now go on with the worke,

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Toffer.

Scholar, If it bee fo, then am 3 out of mp greatest doubt. Then I jopne that 90 (which Hound as the balfe of the latter partition)un-10.48, which is left with the one man, and fo hith be 138, which (3 map fap) to 18 too mas m, for the least thould be but 120, that error 1 note, and then make a new polition, lapa wing the one man to have 204, and the other have 96: wherefore of the 204, there ED D 3 mult

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must be late botone 153, and fo remainer with him 71. Also of the 96, there must be laid boton that is 32, and foresteth with that man 64 : pow of the 153 and 32,3 make one fomme, as 185, which 3 mult divide into the equall parts, and to each man thall babe 92 & inherement if 3 above their former postioners ferbed, then the one thall babe 1564, and the other hath 143 : Talberefore take the feller fumme how agains as 3 old befoze, that it 142 Land finde that be bath too many by 23 for be thould have but 120, and to have 3 to mprivo politions two errors, which I fet both as here may bee feen, each error under his poficion, and then by the Rule 3 Doe multiply in croffe waves 108 bp 23 5, and there rifeth 2538, 108 which I note, then again 3 multiply 96 bp 18, and thereof amounteth 18+

pow because the signes are both like, that is, both too many, I must worke by Subtraction, and so abating 1728 out of 2538, then will rest sor the Dividend 810: then so: the Divisor I subtract 18 out of 23 \frac{1}{3}, and therem maineth 5 \frac{1}{3}, by which I divide 810, and the quotient will be 147 \frac{1}{3}, which is the just portion of him that had the least summe. And the does subtract it out of 300, being the soul summe, then will there remains 152 \frac{1}{3}, as the summe, then will there remains 152 \frac{1}{3}, as the summe, then will there remains 152 \frac{1}{3}, as the summe, then will there remains 152 \frac{1}{3}, as the summe, the summe is the summe.

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Master. For the proofe of this worke, you Note; may chuse whether you will examine those numbers according to the some of the questions, or else worke by other two positions, sor hands the second numbers : and if those positions bring the same numbers that did amount whe two first positions, then both each work marme other.

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scholar. By your patience, I will prove with wayes, not onely to feek their agreement, it also to accustome my mind to those works, in I perceive it is exercise that must bee the chiefe engraver of these Rules in my memory.

Master. Pouconsider it well: then go to.
Scholar. Airst, I will by two other postions, try to finde the portion of him which
hid most.

Master. Although you may doe it with any positions, yet to see the agreement of your worke the better, take the same positions that you did before, comparing them now to the greater, as you did before unto the lesser.

Scholar. Then I suppose that he that had mot, had 192, so had the other 108. Pow if Itake out of 192, that will be 144, and there bill rest to that man but 48. And from the found subject had 108, if I take is, that is 36, there will remaine to him 72: then soyning 144 with 36, it will make 180, the halfe thereof being 90. If I adde to each of those D d 4

two mens portions remaining with them, the one hall have 138, and the other 162, of which two 3 take the greater (that is 162) e fee tt to be 18 roo few ; for tt thould be 180 that error I note under this position. Then for the second position, I take (as I bib be fore) 204 for the one, and fo refleth 96 for the other : then take I of 204, and it will be 152, and there refteth to bim 57. Alfo of the 96 I take ; that is 32, and there remained to him 64; now put I that 32, to 153, andit pecloeth 185: which being parted in equal balues, maketh 92 to be abbed to each mans remainder, and fo the one bath 143 1. and the other 156 : wherefore 3 take the greatest fumme, and it is 23 1 too little, that Do I note alfo, and fet both thefe errors under their politions, as in this Example following both ap peare.

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And then multiplying 102 by 23 1, then

Doth arife 4512.

Mgaine, I multiply 204 102 204
by 18, and it maketh 3672,
which I do subtract out of
4512, because the signes 18 23;
be like, and there resteth

840 for the dividend, then subtracting 18 of 18 of 23 there will remaine 5 to which I multake for the Divisor. And so dividing 840 by 3 the quotient will be 152 to whereby I have found an agreeable summe to that which I found by the sormer positions, sor him that had mes

more which I doe subtract out of 300, that is to totall, there will rest 147?, which was the portion of him that had the least part.

Master. So by divers positions, you see that moth confirme the work of the other. Pow manine those two numbers by the forme of equestion and so thall you prove your work

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Scholar. If that bee which gat moff, had then muft be lap bowne ; of this fum. that is 114 , and fo Gall remaine with him monely 38 ... The other which had least, that #147 3, muft put bown of his fum ;, that is 10th, and fo doth there remaine with him ret A. Then do 3 add together 114 and 495 wit will make 163-7, which I must part inhowall parts, and that will be 81 ... to be atunto each of them : putting 81 1 unto 387, here doth amount 120 just, which is the true portion of him that thould have the leffer fum: and adding 81,2, 282, the totall will be 180, the true portion of the other. And so is the work by this proof also tried to bee good. And his 3 mark by the way, that in their scam. ling, hee got most (as it chanceth often) that with to have had leaft by just partition.

Master. Let your And be to learn truth and it Art of Proportion, and to distribute and at according thereunto as often as occasion this e ministred. And here would I make bend of this Rule, save that I remember the pleasant question, which I cannot over-

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passe, which I will declare somewhat largely because pou chall as well understand some re fon in the pleasant invention, as apt process ing in the wittp working thereof.

The tenth gold and alver.

Hiero King of the Syracusans in Sicilia, but example of caused to be made a Crown of Gold of a wonder full weight, to bee offered for his good succession wars: in making whereof the Goldsmith frank lently tooke out a certaine portion of Gold, and per in Silver for it, so that there was nothing the ted of the full weight, although there was much

the value diminished.

Wibich thing at length being uttered no ebill can alwayes lie bid) the Kingwas for moved ; and being belirous to try the trul without breaking of the Crown, proponed the Doubt to Archimedes, unto whole wit nothing feemed unpoffible, which although prefente be could not animer unto, pet be bad good bon to devile some policy for that invention to muling thereon, as be chanced to enter into a Baine full of water to walk him, bech bed, that as his body entered into the Ban the water did runne over the Tub, whereby ready wit, of fuch fmall effects conjectuing greater workes, conceived by and by an of folution to the Kings question, and the fore rejoycing exceedingly, more then if be gotten the Crowne it felfe, forgat that was naked, and fo ranne bome, crying, all ranne, Eugniza, Eupniza, I habe found, I found: And thereupon caused two mi

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one of gold, and another of filver, to mepared, of the fame weight that the fait Counc was of : and confidering that gold moter of nature then filver, and thereoccupy leffe roome, by reason it is more and and found in fubitance, bee was affumihat putting the maffe of gold into a velwater runne out as tohen bee Chould put the filver maffe of the like weight. With herem bee tried both, and noted not onely the mitties of the water at each time, but also telifference or excelle of the one above the tobereby be learned what proportion mantity is betweene gold and filver of weight. And then putting the Crowne the mio the vessell of water beim full (as and comparing it with the water that ont when the gold was put in, noted methit ald exceed that and like wife comin it to the water that ranne out of the marked bow much it was leffe then and by these proportions, found out the quantity of gold that was taken out of Crowne, and bow much filver was put tend of it: but feeing Virravius which watthis History, both not beclare the particubooke of this triall, it thall bee no inconince to suppose an example for beclaratilike, wherein although the true and just

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Proportion be not expreded, pet the former triall hall be trulp fet forth. And for an eran ple, I sappose the weight of the Crowne tob 8 pound, and so of each the other, two Male And when the Maffe of Gold was put intoth water, I imagine, that there ranne out two pound of water : and toben the maffe offiver was put in, I suppose there ranne out three pound againe when the Crowne was mi in there ran out two pound : Poto to know what quantity of filver was in the Crown, work by the Rule of false position, and im gine that there was two pound of silver, the must there be fir pound of gold; then fap for by the Rule of Proportion : If eight pounded gold be expell two pound of water, what full fir pound expell? and it will be a pound; Againe, for the filver; If eight pound offiver expell three pound fof water, total hall two pound of filver put out? It will be i min abbe those two weights of water togethum they will make two pound &, and it thoubk by the sapposition two pound #, so is it to much by ..

Scholar. Pow doe I understand the well as I thinke, therefore I pray you let worke the rest of the question. And beat this first supposition did erre, I note to position and his error, and take a new position, esteeming the silver to bee but one position must there bee in gold seven pound. The say I; If eight pound of gold doe peebter position.

and of water, what thall feven pound peelde will be I pound 3. Again, it 8 pound filver erpell 3 pound's of water, what thall monderpell e and it will be ;. Row mutt thele two fummes together, and they two pound and they thould make 2 fo is it too little by . Theretoze the politions, with their errors in oider, mit followeth : And then 3 multiply in mayer 2 by and it maketh; Like. multiplied by ; ma-

and because the s be unlike, 3 mult mittele two lums which and that is the

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dend. laine, 3 muft abe ; to ;; and it will be Mitts the Divisor Row 3 thall divide and the quotient will be in that is, 1 1: dp 3 know that there was put i pound Affilier into the Crowne, and fo much duken out for it.

Miller. Diove it now by eramination, ac-

Migto the question, sales abolar. It there were I pound i of filver, was there of gold o pound . Bow fay the Rule of Proportion :

pound of gold expell two and of water, what that 6; 2

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It will hat I pound ? Again if 8 pound of filver expell the pound ; of water, what foal 1 erpell . It will be . . Pow mus 3 appen gether I pound and 7, and then toll me 2 pound & that is 2 pound & according supposition of the question; whereby I por cette the worke to be well done. And Jen not but much rejoyce at this excellent intention, fo my belire is kindled bebemently to be perfectly intruded in overy part thereof, an namely in this point, whether the proponion between water and gold be fuch that fort pound of gold put into a vessell full of water there that runne out two pound of water in in for as much filver, whether 3 pound of of ter month shoth. of seen Jum & ordank

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Malter I perceive your meaning, and me jecture your imagination to be thus that it was knew the eraci proportion between goldend Sch filver, and water, both in their weigh and in the quantities, then could you easily finds on h mixtures of them, which thing I have mix bed for another worke that intrestetbell matters especially. And at this time you confider that you learne Anthenericket intreateth of the manner to folke books Mail questions touching number, without my what maker is figurified by that number were it necessary in Arithmetick, to ten Arts, feeing in it may be moved questions the all Arts.

But seeing you are so desirous to know these A question hings, I will telt you in such a fort, that you shall of the prohife your Art in finding it, and propound it in portion of bare of a question. Gold beareth a greater pro- of gold, min to water, then filver doth, and their two filver, and partions be in proportion together, as 48 to 25, untowater. heto helpe you somewhat in this Riddle, you Unote that the proportion of Quick-silver unto sur, is the just middle number proportionall in hogression Geometricall, between the proporof gold and filver unto water.

In this proportion is : . Rote if pou will butte just numbers of these three Proportons, then must you finde out three numbers Progression Geometricall, whereof the middemost must be 's, and the first must be unthe last, as 25 to 48. And thus I will leave miofinee those numbers, when you bee at

bilinre.

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Scholar, Det Sir, 3 thanke you heartily in this much, for now I fee the positivility to In them out. Howbeit, because this quethe thon feemeth strange, it is might be foresting the true to the forest the more easily finde the true tion feemeth frange, if it might please you to Milter. Pou destre too much if you will stu-

nothing: Therefoze to occasion you the hop the better, I will leave this doubt end wally to your own fearch: But as touch-lies the generality of the Rule, Archimedes met not to take two masses of Gold,

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and Silver equall in weight with the Crown for the proportion might as well be found inp other weight, pea, although the Maffe Gold were of one weight, and the Mallen Silver of another. As for example : 3ft Crowne were of 18 pound weight, as 1) fuppole, and 3 have not fo much other in Gold, but onely one pound, and trying that by water, and finding that it both erveil it of an ounce of water, pet then by it 3 manin. ferre, that 8 pound of Gold would errell 6 ounces of water. And likewife of filver, there of it 3 bad but two pound, and find that it both erpell three ounces of water, then might 346 firme that 8 pound toould expell 12 ounces. that is, one pound weight: and fo is it goods if the three Mailes were all of one weight. And thus to this time I will make an end of this other part of Arithmetick.

Scholar. Although I cannot sufficiently thank you so, this, yet your promise made me to looke so; the Art of Extraction of Root, whereof hitherto I have learned nothing.

Master. I will not breake my promise, but intend (God willing) to performe it with this three or foure moneths, it I perceive this my pains to be well taken in the meme season. And you shall not repent the same ing for it: for it shall be increased by the rying: And in the meane time you shall the this Addition, not for the second Pan of Arithmetick which I promised, but so, in

mentation of the first part, unto which I sold have annexed the extraction of Roots are and cubick, namely, for examples of distinct of Asis of TA ood, but that in the cub part I must write of divers other lats, and thought it best to reserve those also with their Cramples unto the second Part.

Scholar. Sir, although I cannot recomme your goodnesse, yet I shall alwayes doe mendeabour to occasion you not to repent

benefit on me thus employed.

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THIRD PART,

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Additions to this Booke,

Entreateth

of brief Rules, called Rules of Practice, of rare, pleasant and commodious effect, abridged into a briefer Method, then hitherto hath been published.

Inh divers other necessary Rules, Tables, and Questions, not onely profitable for Merchants, but also for Gentlemen, and all other Occupyers what soever, as by the contents of this Book may appeare.

Set forth by JOHN MELLIS Schoolemaster.

LONDON, Printed by M. F. for John Harrison, 1648.

Ser Dhapede mis Belg vy Redeblersvin. Iv sold id no one , or Mered ones but Book of over they was in a force Hev in all of ing the Land She will be The said and the contract of t and the property of the second . The market sommers num was of Divi definitions bef A STATE OF THE PARTY OF THE PAR estant militare le la constant True words, you fit to he was the second of Janes Brand W. J. which 2020 A O A A O A Mines of the a state of the

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The first Chapter of this Addition, american of brief Rules, called Rules of price, with divers necessary questions, profible not onely for Merchants, but also for all other Occupiers what soever.

He working of Multiplication in practice, is no other thing then a certain manner of multiplying of one kinde by another: whereupon is brought forth the product of the pro-

mens of Divition, in taking the half, the third; the fifth, or such other parts of the

imme which is to be multiplied.

And for the better understanding of such conversions, you shall understand that in the manner and use of these Rules of practice, you ought first whow the even or aliquot parts of a shilling, which in this Table following doth appear:

Wherein as you fee according to the order E e 3 of of these Rules of Practice : At fix pence the yard of any thing, you must take i of your number which is to be multiplied, and the product that commeth thereof shall be shilling if any unite do remain, it is 6 pence. 1831

For 4 d. take the ! of the number thatism be multiplied, and the product also produces shillings, if any unites dochemain, each one shall be worth in value 4 pence. The like to be understood of the other 3, &c. 1994

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At I d. the yard, what on advisory will 1 25 .b 348. 110

Here you may fee in the first example the 379 yards at 6 d. the yard, are worthings 6 d. in taking the of 379. And in the feco example the 104 yards at 4 d. the yard, " worth 34 s. 8 d. in taking the 3 of 1041 h wife in the third example, 5014 yards at work, to

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meyard, bringeth forth 1253 s. 6.d. in taking the of 5014. As also in the fourth example 1 d. the yard, maketh 88 s. 8 d. And lastly, the fift example, 409 yards at 1 d. the yard, mounteth to 94 s. 1 d. in taking the 1 of 409. In the fift of the pence is any of the even or aliquot parts of 12 pence.

nd all other the like into pounds, is very easy individing of it in your minde by 20, for it is to be understood that as often as 20 is found in the product, so many pounds doth it contains which with facility to perform, always strike of the figure towards your right hand, with a light down dash of your pen, for the 0 that appreciaineth to the 20. And then begin at the left hand, in taking the half of the rest. And if that if the fast any unite do remain, the same shall be joyned with the figure that is cut off, which shall represent the odde shillings, contained in the work.

As for example, in your third question at 3 d; the yard, which amounteth to 1253 s. 6 d. the product whereof maketh

62 li. 13 s. 6 d. as here you 125 3

may fee, is eafily performed 62—13—6

Also for the working of one peny the yard, it is something harsh and hard to take the distance products: therefore to ease that hard work, you shall first bring your delivered fumme

firmme into greats by taking I part of the product, and if any unites remain of that ; part, metimes there may, they are pence, and me be agnified with a line from the groats with their title of pence; and because that 60 great maketh a polind or 40 fhillings, ftrike of the fielt figure toward your right hand, for the o that appertaineth to 60 (as you did even non for the othat belongeth to 20.) Then in take the of that product, if there do remain in unices, the fame shall you joyn with the figur that you cut off, esteeming them as grain which keep in your minde, and by taking part of them, you shall turn them into lings, and to have you done : As for example, by a question or two hereafter proponed shall more plainly by the work appear.

Here in taking the a part of 1359, in coming to the last work, the a part of 30 belt taken, the remainder is 3, which joyned with the 2 that was cut off, maketh 32 groats, which converted into soldings, by taking the part of a part of a

At a penny the yard, what 45 33 yards ?

113|3 groat-1 d.

At I penny the yard, what 64768 yards?

1619 2 groats ... 269—17--4 d.

The number of pence be not an aliquot part the number of pence be not an aliquot part 12, you must reduce them into some aliquot prof 12. And after the aforesaid manner, you had make of them two or three products, as need three per the sand adde them together into one sum, where for the furtherance appeareth a note of border of their parts, as they are to be taken.

mhere in the first note of this Table, at 5 d.

probati first take for 3 d. the 7 of the number

aris to be multiplied, and likewise for 2 d.

The fame number, adding together

the products: But if you will work by

and 1, you must for 4 d. first take the 3 of the

above that is to be multiplied: and for 1 d.

The the 7 of the whole summe, or rather,

thick is more better, for 1 peny you may take

the of the product which did come of the 4

pence:

Ac

pence: because that I d. is the \$ of 4 pence. The totall summes of these two numbers shall be the solution to the question. And in like manner is to be done of all others, as by these examples following shall appear.

At 5 d the yardywhat	748 yards?
348	187-00
28	124-8
(hillingsod	311-2018
Otherwise, At a pence the yard, what	758 yards?
7878	252-81
rds	63
hillings 800 II	315-100
A A A A SE Ette behar	563 Ells?
first example, when it	b zate beening
ake the of 758, an Enillian	Trop of the
8 Which amounteen to	Til Polidi
peace and io . Pt	Finishes yo
that 5 de the year b.	74 m
Osherwije; 2	53 ST 113 V 12 10 10
At 8 pence the pound, wha	56
2 d	18.
fhillings	74-81

758

me keti

Rul	es of Practice.	417
	IVIII	edc obs
At 9 pence t	he Ell, what to ema	PU FIRS
6 d	ממנסנה כיונה	780-0
8 3 d	be done of hether	
illings	Mongared Hiwoll	267-0d
Commercial	locar V	het pradt
	the piece, what only	pieces?
18 b 6 4 1	35	76
4 d	. 1 26	5
hillings	60	526
distantion.	V.I.	State 5.2113
At 11 pence	the pound, what 757	6 pounds?

At 11 pence the pound, what	7576 pounds?
6d	3788o
4 d 3	2525
Millings	631-4
	69448 d

Pounds 347 45 8 d Here in this first example, where it is demanded (at 5 d.the yard) what will 758 cost? First, for 3 d. I take the 4 of 758, and thereof commeth 189 s. 6 d, Then for 2 d. I take the of the fame 758, which amounteth to 126s. 4d these two sums added together, do make 115 shillings 10 pence: and so much are the 758 yards worth at 5 d. the yard.

I trem, for the same again : First, for 4 d. I take the 3 of 758, and thereof commeth 252 s. 8 d. then for 1 penny I take the 1 of the same 758; that is to fay, of 252 s. 8 d, and it yeeldeth me 63 s, 2 d, which both added together ma-

teth 3155, 10 d. as before,

disce!

of the whole sum which is to be multiplied and adde them together, that is to say; first, for 4d there is taken for 363; which comes to 187 s. 8 d. as appeareth by the work, and for 3 d. there is taken the 1 of the whole summe, which amounteth to 1 40 s. 9 d. Both which products added together, do make 328 s. 5 d. and so much comes 564 Ells to, at 7 d. the Ell.

the 3 of the whole fumme, and another; for the other 4 d. which added together, as in the example doth evidently appear, amounteth to

74:5.08 Buborg ad

Again, for the second work of 112 li. there is taken first the 1 of the whole summe for 6 d. which comes to 56 s, then for that 2 d. you have to take 1 of the whole summe, or if you will, the 1 of the product that came of 6 d, either of which maketh 18 s, 8 d. These two summes being added together, do make 74 s, 8 d. win the third example appeareth.

of the whole fumme, and the 3 of the whok summe for 3 di or otherwise for the 3 d. you may take the 3 of the product that came of debecause 3 d. is the 3 of 6 di which added together, as plainly appeared in the fourth examine.

ple, amounteth to 167 s. o di doute 10dr.

frem, for so d. first there is taken for 6 d. the of the whole summe, which amounteth to 397 s. 6. d. Then for 4 d. there is found 2015

both

do

of

both which added together, make 662 shillings 6 d. appeareth in the fift example, it may also be wrought, as appeareth by the second note is the Table, by 4.d. twice taken, and the 1 of the product of 4 d. or else by the 1 of the whole summe, &c.

hen the i of the whole summe for 4.d. Lastly, the i of the last product for 1.d. All which 3 summes added together, maketh in shillings 6944 s. 8 d. and in pounds 347 li. 4 s. 8 d.

Item, likewise by the same neason, when you will multiply (by shillings) any number that is under 20 s. you shall have in the product pounds, if you know the even or aliquot parts of 20 which are here in this little Table set down to sight.

ch comes to cost the for a cost of course with the whole mune cost the whole mune cost of the cost of

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So that for 10 s. which is the of a pound, you may take the of the number which is to be multiplied, and you shall have in your product pounds: if an unite do remain, it shall be worth 10 shillings.

Likewise for 5 s. you must take the 2 of the number which is to be multiplied, and if there do remain any unites, they shall be fourth parts of a pound, every unite being in value five stillings.

For 4 s, take the ; of the number which

is to be multiplied: and if there doe remain any unites, they shall be fift parts of a pound,

each unite being in value 4 shillings.

ber to be multiplied, wherefore to take the soft any number, you must cut off the last figure of the same number. (which is nearest your right hand) from all the other figures with a small right down line or dash with a pen, and so have you done for all the other figures which do remain toward your lest hand from the same figure that you do separate, shall be the said of a pound; and that figure so separated towards your right hand, shall be so many pieces of 2 s. the piece, the which figure you must double to make thereof the true number of shillings, as by the example shall appear.

Finally, for I shilling needeth small work, for it is so many shillings as be proposed in the summe, which to bring into pounds, hath been

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already taught in the first Rule.

Example.

At ros	the piece, wha	6543 pieces!
\$	the Ell, what	un adi 327.1 105.
1 5 5	Ii. in dai	4373 Ells?
At 4 s.	the yard, what	7839 yards?
At 2 5.	the pound weig	ht, what 7527 pound
3	li.	752 145

At 1.s. the piece, what he person and 3780 438.

and waite being in value 4 failing

Exp followers in ender to the under froods 4 Rule.

that of the number of skillings, be not some muor aliquot parts of 29, you must then convert to same number of shillings into the aliquot ons of 20, and then of shillings into the aliquot ons of 20, and then of thick done, adde them weller, and bring them into pounds. And here in the further auce I have set down a not e of the other of their parts, as they are to be taken to be and and add the of their parts, as they are to be taken to be

261 | [261 | [261 | 123] | 250 | 260 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261 | 261

For 3, s. according to the tenour that you see is expressed in the Table, you must first take for 2 shillings the is of the number that is to be multiplied. Then for one shilling you must take the; of the product which did come of the same is part; which two summes added together, there produceth the effect desired.

12

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At

Item, for 6 s. according to the note fet forth in the Table first, for 4 s: I take the 3 of the number

number that is to be multiplied: then for 2% the for the product that came of 4 s, and adde

them together.

Or else as appeareth also in the Table, for 5 s, you may take the ; and the ; part of the product that came of 5 shillings, and adde then together.

that is to be multiplied, then for 2 s. take the

adde them together,&c.

Item, for & s. according to reason, and the intent of the Table, for the first 4 s. take the ; of the product, and the same number again for the other 4 s. and adde them together.

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for four shillings take the ; then for four shillings take the ; and adde them to

gether.

Othermise, as you see by the intent of the Table, work twice for 4 shillings, as was taught even now for 8; and then take the \$ of the last product for the 1 shilling: but 5 and 4 is the shorter.

Item, for 11 s. first dispatch 10 stillings, for which you must take the ; of the product, the lastly, for 1 shilling take the ; part of the summe produced of the; of the product, and adde them together.

Item, for 12 s. where I will end with the for part of my Table. First take the ; for m shillings, take the for the sum that came of ten shillings, take the sale add

hillings, you may take the is of the whole given number,

To write more of the manner of taking the meants, I omir. The delirous practitioners il (no doubt) conceive it. Also the Table is smeaid to help the unperfect, whereupon by at by I will fer down three or four of these otes in Examples, and the rest I will leave to him own industry and practice, to sabour

This is the order most commonly used in practice, when the number of shillings is not in aliquot part of a pound. But (loving Reader) after I have touched the even or aliquot parts of a pound that falleth out in pence and shillings, I will deliver two new Rules that shall drown this common order quite and clean: wherein shall be comprehended in one line, or working both of even and odde parts of shillings under 20, without regard whether it be an aliquot, or not an aliquot part; which two Rules (when they come in place) I commit to thy friendly judgement in working.

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Now follow the examples upon the notes

At 6 shillings t	he yard, what	3215 yards?
4hillings	He substitute	643
2 hillings	And the second	321-10
li.		964-105.
cion	Ff	Other-

Otherwise by Multiplication of 6.

Other mile of the taken he	
6 failings 2024 .	3215
11 1064	To Billing
At 7 shillings the Ell, what	45 63 Ells à
5 fhillings - 05	1140-1
à fhillings	456
2000 in the land of	97-1 Shilling
Otherwise by Multipli	cation of 7.
30 aku 4563	DI SAL
7 5 3194	In suc it but in
5.A. elqua 1 597-	201 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
At 8 s. the piece, what	7563 pieces
The or is the same same	1512
7 10 mo 10	13512
pounds	3025-41
Greek Finds of marte	The sheet reflex
Otherwise by Multi	plication.
	freeze sich outs
	in one powersus
	4 Chilling
At 13 s, the piece, what	401 piece!
los	200-10
25	40-1
IS	201
pounds	260-13

Other

Otherwife by Multiplication.

o Pounds

10

12

-10

-1

-1

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ha

260-13 5.

These and such like questions of compound imbers, which I have here in this fourth rule fororders sake set down, for that it hath been beet force a common course of work, I action but superstuous. For in the eight and inth Rules of this my simple Addition shall opear, that the given price of any even or oldenumber of shillings, either under or above to shall be wrought at one or two wortings at the most, how difficult soever the question be.

Item, there resteth yet a kinde of practice, how 3 Rule, whom pence into pounds at the sirst working, whereupon you must understand that 240 pence To reduce much one pound, or 20s. In consideration where-pence into sicut off the last sigure or 0, and there remain pounds at unbous 24 (of which 24)8 d. is the part there-tion.

the is part thereof.

Whereupon if it were demanded what 1486 and or pounds of any thing commeth to, at pence the yard, in pricking or cutting of the figure towards your right hand, for

Ff 2

the

the o that appertaineth to 240. There is ne. maining of the faid fumme 148, whereout taking the part, and it commeth to 49 li. and there resteth 1, which I I put to the 6, that I prick or cut off, and it maketh 16 pieces of8 pence, which I double to make into groats, and they make 32, whereof the - part maketh ios, and there remaineth 3 s. which is 8 d, whereby it followeth, that the 1489 yards at 8 pence the yard maketh 49 li. 10s. 8 d. as by therample shall appear.

Item, for 6 d. take a part of the numberfrom the prickt figure; and if any unites remain, they are so many six pences, whereof taking the they are shillings, if there do remain yetone

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it is in value fix pence.

Item, for 4 d. take the part of the number from the prickt figure; If any unites do remain, they are so many groats, which to conveninto hta shillings, take the part. And if any yet remain, they are thirds of shillings, each one in value being worth 4 pence.

Item, for 3 pence, take the ; part from the Bor prickt figure, if any unites remain, they atch in the many pieces of 3 pence, whereof in taking the refer part, maketh shillings: if any thing yet is main, they are the fourth parts of shillings here

each one being in value 3 pence.

Item, for 2 pence, as appeareth also by the metic Table, take the ripart of the number from the the prickt figure: if any thing remain, they in them for many pieces of 2 pence, which by take made and

t I

er part, you that turn into thillings, and if at I my unites remain, they are fo many lixt parts shillings, or pieces of two pence, whether

of line cost 8 pence, what	1486.2
nketh pounds saidman	49108 d.
fone cost 6 pence, what	7865?
aketh pounds	196_12-6d
in, 114 pence the yard, what	8736 yards ?
he mketh pounds	145-12-od.
lone cost 3 pence, what	9874 worth ?
nketh pounds	123-8-6d.
to had the Ell, what	7894 Ells to?
c- nketh pounds	65—15—8 d.

Dit if your number of pence be not an aliquot the Dor even part of 24, then must you bring them cho with aliquot parts of 24. and make thereof dithe referroducts which must be added together, as to the question hereafter following shall appear. ngs hem, for 5 defirst take for 3 d. then for 2 d. Madde them together, according to the in-the action of the second Rule: or else first take for the then I d.

Ilem, for 7 d. first take for 4 d. then for 3 d. the dadde them together.

Ff 3

Item,

Irem, for 9 d. first take for 6 d. then for 3 d. and adde them together.

Item, for to d. first take for 6 d. then for 44

and adde them together.

Item, for is d.first take for 8 d.then for 34 and adde them together: ashu thefe F

and adde them together. ast	A care acretuble
Examples.	2 His . 22 . 22.15
Examples. I If one yard cost 5 d. wh	at 7506?
A Dence	SULGANI
4 Peace	126-7-m
peny	The second secon
maketh pounds	158
Other Wife.	12
The state of the s	1596
3 pence	7419
2 pence	63 - 10 5600
2 If one cost 7 d. what	A TOTAL PROPERTY OF STREET
	9817 Worth
4 pence	16-9
3 pence	12-6-9
maketh pounds	2815-9d.
Other Wife.	District and
To Silvery	-0'-
6 mence	HER TOTAL THE SHIPS
K	in contest with sim
6 pence	रोध देशी विश्व स्थान

maketh pounds Thone coff od. what 68 7 WO

> 6 pence 3 pence

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719

maketh pounds

der fiele contract of Standon

3 d.

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Otherwife.

Rebiling.	and some	7.717	*
s d. then Torg	Halla glade	-98/7?	.57
igalia to pence	et the frago	124-	13-6
3 pence	Lxomples .	12-	6-9
aketh pounds	19 61	37-	-00 -3
41f one coft to	pence, wha	1 98 7 ?	2 dT
Manca Manca		Dan 24-	
Sel 4 peace	, was 2	166	-9-0
mketh pounds	and processing to	41-	-26
If one coft II	pence, wha	£ 9817 ?	Isomori
S pence	Jane J.	32-	18-0
3 pence	indva.b	12-	-6-9
aketh pounds	3.0	45-	-69

But if you have any shillings and pence to be multiplied together, then are you to take for the shillings according to the instruction of the third Rule: and for the pence according to the first Rule before mentioned: unlesse you can spie the advantage thereof, and thereby telp your self; as appeareth in this second example, where first I work for 6 d. which is to be rebated out of the given number, and I have 719 li. 11 s. my desire.

105.	738 369—0 184—10	Otherwise by Rebating, 738
45.		ide-9 18-91,
6 d. pounds	18-9	71-7-19-11s. -11 s. q media

The like again is done by rebating as by these two examples appeareth.

At 18 s, the Ell, what	5418 Ells?
25.	अधिकार्य प्राचनित्र
pounds At 16 s. the Ell, what	376370 H 45,
As- 24.	108
pounds	413-125

7 Rule.

And now I will touch a little the even part of a pound, that falleth out in pence and shilling, whereof for those parts, you shall take such like part out of the given number that is to be multiplied, as the price of that given number bearest in proportion to a pound, which also for their bester aid is here set down,

Item,

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pair of the given number, and if any thing do emain, they are twelve pairs of a pound, each one being in value achilling & pencely, have altern, for 2 hillings 6 pencely, take the part of the number that is to be multiplied; and if my thing do remain, athey are eight parts of spound, each one being in value; a shillings fix ence.

them, for 3 shillings 4 pence, as appeareth by the Table, you must take the part of the given number, and if any thing do remain, they are sparts of a pound, each one being in value 3

hillings 4 pence.

Item, for 6 shillings 8 pence take the ; part of the number that is to be multiplied: And if any unites doe remain, they are thirds of a pound, every one being worth 6 shillings 8

pence.

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Other infinite numbers there are, that may be nduced by abbreviation into the proportibrate parts of a pound, as 16 shillings 8 pence maketh; which 16 shillings 8 pence is easily nduced into groats, by multiplying 16 by 3, and thereto adde 2 which maketh 50 groats.

Then fet 60 the groats of a pound order 50: cutting off the the two Ciphers as is here performed.

And then have you brought 16 50 Millings 8 pence into the knowne 60 parts of a pound, which maketh

But yet gentle Reader, for thy further instruction, I have hereunto annexed in a Table how pence and shillings hear proportion to a pound, which I commit to thy friendly bene volence; it will be some aid unto the ungrounded Practitioner: but I count him the best Workman that can presently reduce his given price into the known and proportionare parts of a pound.

hewifor; hillings a p. de., ds appelied his the Table your nell cake the port of the girls maker, and the maker, and the control of the girls of the acts of the caker one being up taken the hillings a product.

Item, for o shillings 8 per ce take the spare of the amount of the nember that is to be a satisfied; and if my mulicage translate, they are the sort a

pound, every one being u or h & styling s 8

Other Afligies north to be and ethan along benedically abbreviet contract the property

vate pairs of a found, as a substancy to proceed which is subject to the fine R pence is soldly a deficed into groats, exceedinglying a few years.

distribute of a complete of

And the a have you are glid to blings a punction in knowing. And the control of t

L. Re.

A Table of the Aliquot parts of pound, or 20 shillings.

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1/1	LCD	120,0	r armin	- Marin	1884	Pyar	i eli	1
1	d.	-	re 11 7	io n	13.50	1	D.	5
3	4	8	al.J.	Ann.	14.	20	2	0
1	9	87	Carried Ver	40.00	100	80	3	0
1	0	9	- / 1		376	. 52	1	0
3	0	10	113 17	tests	1 - 10	40	6	0
0		11			10,	10	8	0
1	8	11			523	75	Q	1
1	8	12	90 × 100	in on	10:00	150	13	I
3	0	12	र्थ प्राप्त	Second.	1	13	8	1
13	Q	113		21.73	\$ 00	min I	0	13
	4	13	daga	กลอสุธ์		01	6	2
10.	9	13	out o ba	2000 50	31.00	20	0	2
7	0	14	211			-	1	
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+	0	16	4.	20.1.16	-	- 1	0	-
5	8	-		10 .5 3	1	I X	0	-
2	- 1	-		d of f.	1		-0	3
Pf	-	22.75	2	53	-		-	-
8	-	17	2	7-10.6	1	17	5	_
-		18	122 0 1	of Dila	-	7		
11	4_				-	1.2	0	7
1.5	9	18	W	dov no	1	1		7
10	0	19	City is in	ermisa.	10.	1.8	0	Į.
	6 0 4	16 17 17 18 18 18 19		d of f fg sc- d, of g and re and re ten you	Val	16 16	0 0 3 8 0 6 0	36 6 6 7 7 48

Here follow four examples upon the four Notes delivered.

At 1 s.8.d. the yard, what	3884 yards A		
maketh pounds	323-13-44		
At 2 s. 6.d. the yard, what	4563 yards }		
maketh pounds	570 - 71-6d.		
At 6 s. 8 d. the Ell, what	7562 Ells ?		
maketh pounds	2520-13-4d		

Nom by custome you are able to work by all forts of summes being delivered in shillings and pence, as one shilling one peny, two shillings two pence, three shillings three pence, and so of allsther: wishing you to have some consideration of your questions, when they are set down for there are many subtile abbreviations, and great advantages to be gotten, and easily to be perceived.

As of 3s.	8 d. of 2	s, and I s.8d.
Of 45,-	-2 d, of 3 s	
	d. is + of 3 s.	
Of 5 5.	8 d. of 4 s.	rs 8d.
Of 5 s. 10 d.	of 5 s. and 10 d.	which 10d
is ; of 5 s.		5 7
The state of the s	THE RESERVE OF THE RE	1000

And by this mean when you have taken one product, you may oftentimes upon the fame take

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1 you oft you figu

fron dife rake another more briefly then upon the fum which is to be multiplied, &c.

Tow (Gentle Reader) that you have feen the 8 Rules vertue of the even or aliquot parts of a pund in shillings alone, and also in the aliquot mets of shillings and pence : according to my pronife hereafter followeth a briefe and easier methed for any even number of shillings, either under mabove 20, then ever yet hath been published; Notwithstanding M. Humphrey Baker, whose travell is worthy commendation, and whom for howledge sake I reverence, bath in some part touched this first part, though not in this method. The work of the Rule both pleasant, ready, and brief, as by the variety of the examples delivered thereupon shall appear. And first I will set forth aquestion, thereby the better to expresse or teach jon the order thereof: which is this.

If one cost 6 s. what 8574?

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8574 maketh pounds 2572-

To the understanding of this example, after Mr. Iohn you have fet down your given number in form Mellis his of the Rule of 3, with a line drawn under it, first Rule, you shall presently set a prick under your first figure 4. toward your right hand drawing from the prick, as heretofore hath been pradifed, a little short line, thereto fet down

the

the shillings anon, which done, multiply the first figure 4 by 6, the value of your price; (which here you fee standeth in fight above the line) it maketh 24, which is one pound force shillings. Theone pound keep to early to the next place, and the four shillings fee down at the end of the prefcribed line rowards for right hand. Thus have you done now with above the line and also with 4 in the first office (for the prick under 4 doth fignific that 4 hith done his office.) Then fecondarily for a gene rall Rule take but the of the given price; which here is 3, which 3 is the number that shall now continue the rest of the multiplies. tion, and end the work, whereupon I multiply 3 into 7, standing in the second place it maketh 21, and with the one pound I kept in 22; fet down 2, and keep 2 in mind, working according to the Rule of multiplication, delivering the tenths in minde in their due place; which done, the product from the prick to your left hand representeth the pounds, and the other at the end of the shilling, as appeareth by the examples.

If

mak

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make

Note a generall rule.

If one yard cost 2 s. what	7536? 7536
maketh pounds	753-125
If one yard cost 4 s. what	879.2 ?
To de la fact 4 stored etc.	8792
maketh pounds	175885

Rules of Pr	Actice A 417
If one piece coft 6 s, wh	at, 95377
10 12 10 10 10 M	9937
elech pounds	25.
lione piece coll 8 s. wh	at 7509?
I ob aside a Partiral	7509
eketh pounds: a.m. bad	300-12 5.
fone cost 12 s. what	3794!
13 Tanga 235	5794
mketh pounds the contract	3476-8 5,
	3705 3 315
nketh pounds	3705 00 Won 15
	2593 10 s.
lione cost 18 s, what	5703?
I IS	5703
mketh pounds	5132-145.

Let these suffice (gentle Reader) for an enmore into even numbers. And now I will have the like rule for any odde or uneven part suppound.

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It

Ifone cost 22 s, what

match pounds

To help you to the understanding of these other Questions that hereafter follow: where my first Example the given number is 6487 at 3 s. theyard: I multiply, 3 above the line into 7, it maketh 21. The one shilling is set down and the 1 pound I keep. Now am I to take the instable three, which because it is an odde number I cannot.

Mr. John Mellis his fecond Rule. Therefore I shall keep and continue my multiplication by three still, and work by the i of the
rest of the given sigures or number, to wit, 648.
And sirst the i of 8 which is 4 multiplied into 3,
maketh 12, there to joyn the 1 li. in minde, it maketh 13. Set down 3, keep one. Then again multiply
by two the i of sour it maketh six, and with one
in minde it maketh 7. Then lustly, take the iof
six, which is 3 saying, 3 times 3 is 9, which 9 set
down, and so is the question answered, as appeareth
by the practice, and examples following.

elfe

At 3 s. the yar	d, what 6487?
maketh pounds	973-415
If one yard cost 5 s.	what 4269? 4269
maketh pounds	16755.
At 7. the Ell, who	at 6489?
maketh pounds	2271
If one Ell cost 9 s, v	what 2807?
o special from a 9	2807
maketh pounds	1263

	Tenteres	T Tanetre		437
ACT INS	the Pittole	t,what :	8263 ?	the fumin
	was taugh			
keth po	unds ni	In thing i	45 44	135.
	ece colt I			
1	12		4629	

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nketh pounds 3008-175. At 35, the yard, what

But now note (gentle Reader) when the gen price falleth upon an odde number, as 3, 17.11, 13, &c, then it is to be presupposed that degiven summe to be multiplied, must be a somme made of even numbers, 2,4,6,8,10,&c. ele cannot that question be wrought at one he or working.

Providing afways that it may bear an odde fore in the first place towards your right und, as appeareth in thefe fix examples, which lift were wrought, and fuch like, &c. which may bear an odde number for the price, and become at one line or working very well.

But if the given price be an odde number, methe fumme to be multiplied, odde numbers ilo: then can it not be done at one working, but requireth the aid of two workings, for de with odde will not agree, which notwhitanding to bring to passe, take this for a A general merall Rule. First, work for the even numcontained in that question, or given price, wording as you have learned, and then afterards for the one odde shilling, take the ; of

the summe given to be multiplyed, omitting the first prickt place, as was taught for the working of one shilling in my first Rule of Practice, and adde those two together, and you shall have your defire.

648
maketh pour le 3 9 yards 9
753 1 8 176 119
regive com
Minme III. elle cane 59887 line of v. 98887
THE WAY
638
53-42 vsin
751-1-08
376

Nocethis well.

And thus have I abridged into the fetworth how to bring any number of shillings, what wer they be, into pounds, wish a briefer Methol then ever yet hath been published, which I to mend unto thy friendly censure and judgeous in the use and practice thereof.

TÉ.

Rules of P	m@lod"
Hand coft 6s ed wher	one entodes
ofed of many somme	E ha encelerates at Comm
10 10 10 10 12 12 12 12 12 12 12 12 12 12 12 12 12	10 10 4
miketh pounds	394-18-11
Ari 4s. 2d. what	100 1 2825 2 01 0 W
malgarizad com vo ca, she	1977 -10
naketh pounds	2001-0-10
Miss. 4d. what . bis	AL 15362
165.	2024 -16
mketh pounds	2066
e to the willy secreous the	Lucation into the advanter
436 the Putolet, what	80040
whech pounds and or	15. A rend well a name whome
kys, the Crown, what	6519 ?
be the price whar	2285-20

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These three last questions may seem something harder, yet they are easie enough, if you mark them well: If I should explaine them, hen are they too easie. Therefore I leave them to whet the minds of the desirous.

asketh pounds 2955

Gg 2

Item

10 Rule.

I Tem, When any one of the fourmes, which will be multiplied, is composed of many denominations, and the given number but of one figure a love then shall you multiply all the denominations of the other fumme by the same one figure, beginning first with that summe which is least invalue toward your right hand, and bring the product of those pence into shillings, and the product of the shillings into pounds, as by this example appeareth.

At 3 lie 7 s. 4 d. a yard, what are 9 worth)
maketh pounds 30 6 s. - od,

11 Rule

Displied shere be a broken number; First work for the whole according to the instructions that you have learned, and then take fuch part of the given price, as that broken number boaresh in the portion to the price, as in the examples following. After you have wrought for 3 swand for 6.4 has are you to take the 1 of 3 s. 6. d. for the 1 yard, and udde that to the summer is so adding the day and udde that to the summer is so adding taked 3 products together, which make 43 his said the just price of 245 1 Ells, and thus must you do of all other.

10 At 3 5. 6 d, the Ell, what 1 3246 }? | goid

muk spen swell: If I thould explaine of emthen we the trop eather I herefore I leaves been lowder the minds of the derious.

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re to the hundred a	fold ofter hos leve	to interest of
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4 d	Janes 10 6 9 tons	-48
. 13 s. 4d. what one	nound coil ar li	323
mketh pounds		Primo
100 miles (100 miles (The second secon
If one piece cost	Back I Later	-ilus
Hone piece cont	u. 3 5,0 3 d. What	12 pie-
more neatly it is by	1111	
direct a deril in	48	0 C 5 3 9
a little underland ingended thus	1-16	
ed saun ranua gui	6	6
	min . I all	016
27 Shawarshed	-	
maketh pounds		7
The	proofe.	d.6.4 o
Il 12 pieces cost 50 li	2 s.6 d. what on	e piece?
meketh pounds 4		
0400	.b. 3 .22	Maketh
Tem, touching the n	nanner bow to und	erstand 12 Rule
th order of this quel	tion and others	he libe
offfeek how many tim	20 14 22 Pain 12012	Y S
thich is 4 times, and so	Work And Tabou	nihich!
mus 4 imes, and je	a neuro	Which
pound converted into	journess, and joyn	ra with
other 2 shillings, mak	eth 42 shillings: V	pherein
found 12, three times,	resteth o shillings:	Which
med into pence, putti	ig thereto the 6 p	ence in
first place, it maketh	78, wherein 12 i	sfound
first place, it makets mes, resteth & pence.	which containeth	12, but
time, put that to th	e 6 pence, and th	en the
ution is 4 11. 2 5.6 5 8	as appeareth by	he pra-
ution is A li. 3 5, 6 4 d	s towards the lift	39,5
		4 1 1 4

Magis et 'suit nawy Chais a Buildurg affettig

13 Rule.

Item, the like is to be stone of any thing this is bought or fold after five score to the hundred, or the Quintall, At for example.

If 100 pound cost 27 li. 135. 4d. what one pound

27 li. 135 135	But to work it
5, 5 53 12. 17 1	more neatly it is by a little understand. ing ended thus.
513	27 li. 135,14d.
d.64 0 160.01 } Maketh 58.64d.	1 5 5 53 223310 cm la do

I have wrought this at length for the aid of the yong learner, because he should understand how all the Multiplication is set down.

Icem, to the understanding of this and such like questions, the right downe line is all the guild, which is pulled down close by 20 as you see in the example, where 27 pound 13 shillings is reduced as into shillings and maketh 553 shillings.

The 5 towards the lift hand being Jeparan With the banging or right down line, is the pl

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Teo and mell

Maketh vs. 61

Mextly, 53 shillings is multiplied by 12, to the quast of sheet to pence, putting to the 4d, it yeel inher the multiplication of the first figure the and the ane beyond the line towards the left and, is I penny towards the rest of the price: then stall o multiplyed by I yeeldesh 53: but the 5 hand the line towards the left hand, is also 5 puce more, towards the price, which I and 5 I alle tagether under the line; it make the 6d. So is there found now, as appeareth by the titles of shillings and pence, 5 shillings 6 pence.

Finally, I come now on this side the line towards the right hand, and under 12 I finde sinst 10, and thin 3, which added together, make 40, under which 40, you must put the 100, and it maketh which abbreviated, commet to 3. So the just rice of one pound after 5 score to the hundred, wheth 5 s. 63d. One example more, and so I

will leave this rule.

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	t 101d. what 987	4?
6d	246	-17
4d	164	114
	20	11-5
- ≟d ≟d	18 11 10	BUT 5 Jake 8
H.	442	5 25
Marto :	20	Penny
Ma-		2
keth f.	8 45	· ·
	13	9
A PLANTA	45 191	parts
d.	5 100 100	ar.
	G g 4	Alfo

Also the like may be done of the usual weights here in England, (which is 112, for every hundred weight) in case you know the aliquot parts of a hundred weight, which are these, 56 li. 28 li. 14 li. and 7 li. For 56 li. 4 the of 112 li. 28 li. is the of 12 li. 14 li. is the and 7 li. 14 li. is the and 7 li. is 72 part.

of the money that 112 li. weight is worth.

For 28 li. take the fof the fumme of money.

that 112 li. weight is worth.

For 14 li, take the 1 of the summe that the

than 112 li. is worth

As for example; at 17 li, 195, the hundren pounds weight, that is to fay, the 112 li. which thall 3 quartors and 7 pound cost?

2 quarterns 1 quartern 7 pounds	8-19-6	64
	1-2-54	115
Maketh pounds	14-11-8;	Di
Ca &	SAI	.11
Š		Mı-
n - al	845	1 The
3'-/	1.5	
br	5 100 160	5 0

as Rule.

us Rule

dissipple

The feedud example toward your right band the fecond Chapter intreateth of the Reduction of divers measures to others value by Rules of Practice inich noy double she

The proof.

OD Ow will I from a few examples of 18 Rule. Practice, in reducing of measures. as Ells, Yards, Braces, Pawns of Genee, &c. Much more would I have touched, but that I feare the luke will rise to too great a Volume.

Tem, for the under flanding of this marke, if 10 864 Ells of Antwerp, how many yards of found, adde that a por and the yards to graling uppe work by the practice, and the product flore

the Ellr of A A berpe. 864 432 Item, in 20848 soi London,

maketh 948 yards of London, 320 yards Proof.

M

Tem, in these and such like questions of Flemmilimeasure, to be brought into yards Engfirst take the sof the given number, as apweeth in the first example towards your left Then take balf of that product, or the ! given number, and adde thefe 2 products to then is they hall be yards English, as by the Practice, you may redusorbrig gam woy blom by the like reason's aforesaid, in taking the P The

The second example toward your right han is get briefer then the first, whose worken the Take the 2 of the delivered number, and the product subtract out of the given number, at the rest showeth your desire, Of these two ways use which you thinks best

The proof.

How many Ells of Antwerpe?

648

maketh 863 Elle of Antwerpe.

15 Rule.

I Tem, for the understanding of this worke, for take the part of the yards of London, which found, adde that & part and the yards together appeareth by the practice, and the product shemilt the Ells of Antwerpe.

Item, in 20 yards of London, How many ells of Antwerpe? maketh 426? Ells:

320 yards Proof. 106; 426; Ells 106; 106;

320 yards

alletto o.s.S

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S co,

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16 Rule,

Other Reductions.

Tem, you shall understand, that for a such a first Braces of Millain, make five Ells of the werpe, whereupon according to the Rules Practice, you may reduce the one into the by the like reasons aforesaid, in taking the said

more subtruct the same, to make Ells of Anciepes and again, by the contrary, taking the same the sumber, to turne the same Braces. As for example,

in mort but described facility of but enoil with more than a soul with the but the contrary. The contrary.

146 7 30 Ells Flemmish.

Mi 190 Antwerpe. 146 Braces.

Ells 730 Antwerpe.

1821.

yes

reth

EIR.

Yards 547 English.

Thus appeareth, that 876 Braces by Practice mke 730 Ells Flemmish, which Ells Flemmish marde,

ho again upon the fame first question of Bram, I would know how many yards English my make,

Aker the rate that 100 Braces are

876 Braces.

438

1 lo 1 109

trolwer, 5474 yards. all your won

Tem, to the understanding of this worke, and such like, stiff take the i of the given Braces, after take the i of that halfe, or the i of the unmber, and adde them together, and the manufacts are also yards English.

Ms of sur-

Item,

Tem, three Ells of Rochell make & Ells on Lisbone. So likewife three Ells at Liensman 5 Ells at Antwerp.

To work these and fach like double the Elled Lions, and the Ells of Rochell, and from their products subtract the it and their ests shalk bests Ells of Antwesp, or the Ells of Lisbone. 278

I ala I Example.

In 63 Ells of Lions, In 106 Ells of Roll how many Ells of Ant- chell, how many Ells werp?

Anf. 105 Ells of Ant. Anf. 166 & Ells of Lilland Touching the proof of return of the feed fuch like questions, for a general! Rule, lyon shall first take the i of the given numbers with adde that i and the given sumber together, and the i of that product shall be your defire.

Example.

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In 105 Ells of Ant- In 166; Ells of Liverp, how many Ells bone; how many Ells of Rochell?

tem, to the underfrong of this worke, and ten like, fife take the of the fire fire as the fixed the of the fire of the fire fixed the of the fire fixed the fire of t

Anf, 63 Ells of Liens, Anf, 100 of L

icem,

Quellions of Factoridge, 1.48 li, 16s. 8d dueftions of Factoridge and Interest, briefe and staly resolved by the Rule of Practice with d, which makes 22 s.4d,cut off the two laft y li. then mulciply the dol I Queftion. bus ace voul se the 8s, and it maketh To shillings per Centum, what comes formub & zi ilo888feth 4s, then m ba Anfwer. Note fi.22. 15 5.03.10 is the fourth of the sur 120 dor dissor and there reflere ten dayer partie par Willia Po stad whichen Lalog ogoth of yang mies 2215 li-3s. fe doup ont ca awins ent at W the Root is 100, ide by, fo cutting the ? 1 2811 401 wo last figures away 24 10 23 ofthe pounds, is 22 li. 2 1 1 100 50 hen multiply a sliby 205 fo adde the yunto it, outhall have 303 s. cut away the two last fimes, there refteth 3 s. Laftly, there remaines swhich I multiply by 12.to bring into pence, Ifo I finde od. and the remaining, which

nt nt

er,

e.

swhich I multiply by 12 to bring into pence, also I finde o d. and for remaining, which ing abbreviated, makes ? parts of a peny, so inde that there is gained 22 li. 35, od. ? parts if peny, and a strong about the delignment of the three is gained 22 li. 35, od. ? parts if peny, and a strong a strong about 12 li. 35.

452 Questions of Factoridge.

9) 4	TODS OF FR	Constitution Applied Transfer	1
2. Queft. At	ten s.	1448 li.	16s. 8d
per centum, what	comes	Sinne of F	100 PM12000
Answer Note t	hat ten II	7. 24.8.	23
s. is the; of zos	. I take	20.	4.
the; of 1448li.	165. 8 C	4. 88	五边
d. which makes	72411.8	12	7 7 2
s.4d,cut off the t	wo last	10-	1
figures, & there	reftech	180	-
7 li. then multij	oly the	200	
24 li. by 20s. an	d adde	106 0	3
the 8s. and it i	naketh	10'0	5
488s. cut the tu		5 Halling	TA
figures off, and	there mestet	h 45. then	m/m
ply 88s. by 13	d. and take	in 4d lan	dehere
resteth 1060d.	cut off the	two last	Egure.
and there resteth	ten da and	which	15 2 014
peny, to the wh	ole dum is	711. 45. 10	repide
is the aniwerto	the queltion	215 1 200	c saylom
3. Queft. At	15 S 10	08 1.1950	d.unio
per centum, what	comes in	594-A NO	TORN
Answer. Note t	hat 1556.	252.30	70 Air
is and or los	. Take TENTE	7 56 00	n 000
the + of 1009 I	. I 2 S	Janahana	12 1201230
there reiteth soa	1. 06	It surrel	· em mas
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together, the tota	II WAII	19000 0000	力。经期
bee 756 li. os. c	पर: १म पर्न गा	galum Lda	idwas
the two last figur steth 7 li. then mu	es, re-	To should	ollin
tern 711. then mu	ncibility with	इ सिर्वादिकार ह	E 500
by 20s, and take in	yourning	100 10 25	1900
6s. it maketh 11	295. cut of	the two	學習
gures, there refter	n 11s. then	multiply b	y 134
Anna L			there

re commeth 348d, cut off the fall two fithere refleth 3d. and 11 which being periated maketh " parts of a peny, fo thall finde 7 li 11st 3d find which is the the erto the question.

1. 868 fi. 135, 4d. , Queft. At i fi. per vigiting and what comes mas I yo bus of toforer. Cut: away and by and hall rook two last figures, and a part the how one take in your shil- and 12,00 at nordw hall finde 8 li. 13010 17 3millano as doth appear d, 68 0 4

dis work. Queft. At 2 la per

Morer. Multiply the hole fumme by 2 li.

will figures of your

0.26 1001

and by 12, taking in whillings and pence 400 you shall find 1121. 3s. 4d. which is either

Mor or Broker, &c.

what comes 5008 H.bs.8d.unto? 112 16. 13

33

Queflions of Hactoridge, 454 per centum, what comes book 185, 2d unto Andre Mulciply the in a seem betavend fumme by 3 h thus then 2402. 14 6 bill un cut off the two last fi-ונינים נחב מחבומב gures, and you fhall find 24 1. then mulciply 19 54 1A And by 20, and by 13. taking 2010 32 10 dw amin your shillings and pence yow 114 . with and you shall finde os. bna a wait liel owing 6 d. 37 parts of a peny, ar bo 54 2 y viquim which is something a-limb that the same hills bove a half-peny.

Data . 1995 but an hills of Questions At source; 1, il 8 share liad to 100 and 100 an Answer Multiply by

Ali. thus, cut off the alos 3. Angle her man, what or omes slub served that own ply by 20, and by 12 dig 63 full rowinh 9 taking in your shil- it is a amund slow must be lings and pence, and it is now not and and you shall find it is 19 s nov so sarugh slow 61. o d. 3 parte of a penya ad 83 woy er about thew which is fomething a-Lan 136 18 9bns 300 them bove a farthing, volviaco 50 251 ilei them in gaillest er yd baso 4 1:

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abb outhillings and pence 000 the abon that find 1121, 3s. 4d. which is cither soil

BARG 3

Queltions of Factoridge.

8 Queft. At 5 li. 3; prentum, what comes Abswer. Mulciply by Il thus, then take the of the whole fumme, of place the figures ethen take the ; of thit; & adde all three ins together, cut off the two last figures, the multiply by 20 & 112, taking in your fillings and pence, & mihall find 2101.7 s. 14.2 parts of a peny, the mich is the answer to

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be question.

	unto	
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1829		
914	-	
10138	05	10
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7.65		TOY!
112	ino s	32.110
-		nallb.
130		
66	4 49,4	100
7 99	201	THE STATES
10	2	

9 Queft. At 61. per only datum, what comes Afwer. Multiply by Stirles. ow 6li and then take tof muor dewhole summe, adde lan multiply by 20, & 110 y 12, taking in your dde shillings & pence, Lios. 10 d. .. parts of a my, which is the anwer to your question,

5684	li. 129	.6d.
341 07	15	0
2842	06	3
369 50		3
120	_	
95		
ÓI		
15	13	
10	0 20	

centum, what comes 3868 ling s.4 d.unio A wo Makiply

Multiply 37080. 13: 444 by 7 li. then take the 5, 11934. 06.8 10 10 adde them together, 290 1500. 0 cut off the two last figures, then multiply by li,3s, the answer to the so os of viculomosis queltion.

11 Quest. At 8 li. per centum, what comes 2560 l. 175.9 dantol de

Answer. Multiply 8 204 87. 02,0 li, cut off the two last figures, multiply by 20, 17 42 and by 12, and you 12 shall finde 204 li 17 s. 84 5 d, i parts of a peny.

6 6 ctrings : 42

2067 12 55 612 51 W

6 li

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Mostro d. J. parrs of a

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Duestions of Interest with Time, wrought by Practice.

I Queftion.

id:

what comes unto for 1 month

2813. 00 0

Morer. Multiply by
the there commeth
the for 1 month the first of the Totall, and you
hall find 234 li. 8 s. 4

to of the two last finants of the pounds, d, 10 6 0 13

Multiply by 20 and by

Multiply by 20 and

Hh 2

2 Quest.

pence, and yen thall finds 197 h.; 2.11 d.; pursot a pencycou de-

2 Queft. At 7 li. per centum, what comes 3800 linias 8d. unto for 2 months.

Answer. Multiply by 7 li, then take; , adde them two together, then for your two months: take the fof the Totall, multiply by 20 and 12, taking in your odde shillings and pence, and you fhall find 47 1, 10 s. I d. : parts of a peny, which is the answer to the question.

3 Question. At 8 li. per centum, what comes unto for 3 months.

9864 li. 165.4d.

100 20 10

17 P dem

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cents unto

ofth

10 aor

12 5.

Answer. Multiply by 8 li. then for your 3 months take a of the Totall, multiply by 20, and by 12, adding in your odde shillings and pence, and you shall finde 197 liss s. 11 d. 3 parts of a peny, your demand:

3.1	n tri	1 1810
789	18	10 8
197	29	12 8
1	20	one viso
.5	92	a il sali
ien.	12	a rotalura
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	93	12 10
1		6 3
	10	0 50 25

d Quest. At 6 li. per what comes unto for months,

Answer. Multiply by 1. then take 4 adde both together, then for your 4 months take 5 per of the whole, cut way your two last figures, multiply by 20, and by 12: adde in your odde shillings & race, and you shall me 13 t li 14 s. 10 d. 5 parts of a peny, your temand.

ALC:

guestion. At 8 par unium, what comes unto for a months.

Answer. Multiply by blithen for 5 months take of the Totall, cut of the two last figures of your pounds, Multiply by 20 and by 72, and in your odde shillings and pence, and you shall finde 100 lials. 4d. your demand.

6080 fi. 13 s. od.

10050

3020 li.00 s. ood.

centum, what conses

unite for a month s.

6 Question. At 8 per centum, what comes unto for 6 months.

Answer, Multiply by 8 li, then for your 6 months take the of the Totall, cut off the two last figures of your pounds. Mulciply by 12, taking in your odde shillings and pence, & you shall find 322 li. 8 s, 5 d, 37 parts of a peny, your defire

7 Quest, At 8 li. per centum, what comes unto for 4 months.

Answer, Multiply by 8 li. then for your 7 months take ! and ; of the Totall, cut off the two last figures of your pounds, then multiply by 20 and 12, taking in your odde money, and you shall finde 275 li. 25. 11 d. your desire.

8000 li. 12 500 dantan into for moneys 64484. 16 5. 322 42: 08 QAL 120 10 10 10 both to rettour 8x80r 100rd Promains 21 6 nar of the who be cut away your care 84: II-576 38 19 m ,85108 100/50/25 50 MICH

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er centam, what comes	3680 li. 08 s. 03 d.
Answers Multiply by	29443. 04 0
Ethen for 8 months	0814 08 0
of the totall, cut	0814 08 0
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our pounds, then	land 10 par lo land
iply by 20, and by	1
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, and you fhall	Lice of the strangs
16 li. 5 s, 9 d. 3	76
curc.	- प्रिकेट प्रवास का अर्थ
	912 122 6
Queft. At 8 li.	100 50 25
ium, what comes	3684 li.19 s.od.
or 9 months.	3684 li.19 s.od.
The Duck of the	29479. 12 0
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months take ; and ; and ; of the whole fumme, woff the two last fithe ries of the pounds, who ha multiply by 29, while day 12: taking in the weodde shillings and egat race, and you shall 100 de 221 li, 1 s. 11 d.

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which is something above a farthing.

per centum, what comes 100 li. as. ad. unto for 10 months.

Answer, Multiply by 6 li.then take the; and of roo li. adde all 3 fummes together, then for the 10 months take and of the Totall, adde them together, cut off the two last figures of the pounds, multiply by 20, and 12, adding in your fhillings and pence, cutting off the last figures of your shillings & pence, you shall find 5 li, 12 s. 6 pence your delire.

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Questions	of Interest	
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11 Queft. At 8 li. 886 li. 16 s, od. or contum, what comes into for 11 months. 7094 08 0 Answer. Multiply by 2364 16 , 10 Slithen for it months 23641176 18w bas nke? and 1 from the 1773 12 Totall, adde all three 65103 04 0 fimmes together ; cup of the two last figures of your pounds. Multi-016455

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ply by 20 and by 12, uding in of your Thillingsand pence, cutting 64 of your shillings and 768 34117

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perce, and you shall

mide 65 h. os. 7 d. 17 parts of a peny, your Mile. 12m Queft. At 8 1. wast to boding in the

prentum, what comes 9080 li. 12 s. 2 d. unto for 12 months.

Anfwer Mulciply by af cut off the two falt gures of the pounds, altiply by 20, and by hadding in your fhil-

the two last figures of 100 50/25 foor shillings, and the

161

tho laft of your pence, and you hall find 726 l. 111 d. 17 parts of a peny, your delire.

726 44. 17 20 8 97 mgs and pence, cut off 1) 68 3417

The

Both of the State of the SSG in 16 & c d.

The third Chapter teacherh of the Order and work of the Rule of spree in broken numbers after the Trade of Merchantis of digressing something from Master and Records, which is comprehen-

of the Rules of Practice, I will give a few instructions, after my simple order, for the working of the Rule of three in broken numbers? Wherein I shall need to say the lesse, because I hope the studious learner, that bath travelled any thing in the Grounds of Ars, is not unsurnished of knowledge capable to understand me.

4

But before I deliver any instructions for broken numbers, I will propone a question which shall be wrought three sundry wayes, thereby to shew, as it were, three degrees of Comparison: how fure the Rule of three so broken, for more speed of work, different from the whole, which I rather set down to a view, that theistudious herein may be more desirous to attain broken, leaving any more to discourse in Dialogue form, but onely so give instructions where need is; and in the rest to put forth the questions with their arfunctions.

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Here the product is pounds, according to the title of the fecond number.

Hone yard coll 6 s. 8 a 800) (88) 89 1. brin 333

I answer, 263 li.

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Plain!

Inen Now that you have feen the three former vertues of the Rule of three, whose products have first brought forth d. next s. and lastly li, I will deliver three notes in order following: and with them a dozen questions that that thew the work of the Rule of three in broken numbers or Fractions.

Note thefe

1 The first foure shall be fundry questions three well. of a Fraction comming in the fecond place.

2 The second foure shall be of two Fracions comming in the feeond or third place.

3 The third foure of Fractions in all three places.

-91 3111 condivey.

Notes upon the first Rule for a Fraction comming in the second place.

My first Question is this. and and

1 Rule.

If one yard cost me 3 s. 4 d. what are 756

worth at that price ?

The first variety.

In fetting down the queltion to perform the work, I turn four pence into the part of a fhilling, which is; and then the question standeth brids all thus :

-634-

To

To the ready working of this question, and all such other like: my first note is this, which take for a generall Rule; that when any one fraction shall come, either in the second or A generall third place, that the Denominator of that Fra-Rule. Sion or Fractions, must alwayes be brought mot the Number, or Numerator of the first place; and thereby multiply the one into the other.

And this benefit is always gotten by the verme of bringing the Denominator of the fecond
Numbers Fractions unto the first place: For the
fraction in the middle number is now releaNote this
leds and the product that commeth of the muliplication, is of the nature and like denomination of the whole number in the second

blace which here are shillings.

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Whereupon now to work the Question, I bing 3, the Denominator of the Fraction in the second place, unto my first Number 1, with aline set under thus 1, and the 3 under it thus, having, once 3, is 3 my Divisor: that done, reduce 3 is, saying 3 times 3 is 9, and the other lover 3 make 10: my second number in the last of three, by which 10 I doe multiply my let number 756, as appeareth by the work thereof, and it yeeldeth 7560 shillings my Dividend.

Then dividing 7560 by 3 my Divisor, its seedeth in quotient 2520 shillings, which taketh 126 pounds, as appeareth here most plainly, both by the example and the work.

ha At 3 stad the yard, what 756 yards & T ake for a state the cone, char when an one one the friend or one

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Hon or hearing, much alwayes pe's apres \$560 2520 (126: mill 10 .754 ald ads and

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Tenather wife upon the Same question, altering the price now into the proportion at beareth to a pound, for the 3 5. 4 d. is spart of a pound: which example first standeth this as appeareth on the left hand, and afterwards wrought as appeareth on the right hand.

en then se

The fecond variety.

1 756 grown or wit magazinivi will some of the station of 756 pounds state of the state and and in Manher to with

As foon as I have carried 6 the denominator of my middle number unto my first place, as before hath been taught, I pull down 1, the nomerator of 6, with a line under 6, thus, and that one in custome I pull down in fight; being the figure that I will multiply my third or lift number by, according to the tenour of the Rule of three. And because one can neithet mulciply horyer divide (though here it is let down in torm of Multiplication, the rather for your understanding) the product of the Multiplication according to the declaration

of this my first Rule or note, is converted into the title of my second number, which here are pounds. Now followeth the division performed in my Divisor 6, to make an end of that question,

18 (126, which maketh 126 li. as before,

And thus much for the variety in working that question.

And now followeth another.

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My second Question.

If one yard of Cotton coft 8 d. what 859 ?

2|32r 2|1 li, 91 19 d. 8347 (7086 (590 (29 10 10 6)

This Question was also wrought like the first, bringesh forth 29 li. 10 s, 6 de the price of gards.

My

ore road north My third Queftion. We called the

what comes 987 pounds to?

And now followeth another;

And people of the followed another;

And people of the followed and followed are followed another;

And people of the followed another are followed and followed are followed as followed and followed are followed as followed and followed are followed as followed

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Fractions comming in the fecond and third place.

My first Question is this.

IF one Ell cost 13 s. 4 d. what halfe a

Answer. First bring 13 s. 4d. into the part of a pound, which is 1, and then will the question stand thus.

Tempfor the performance of this work the as before was taught in the first Rule with bring

bing 3 the Denominator of the Second Fraction and your first number I, fetting a line under it thus, 15 Saying once 3 is 3, that done, bring 8 the Denominator of the third Fraction, fetting runder 3; and multiply them together, faying, times 8 maketh 24; which 24 is your Divi-(Now have you done with the Denomistor 8) therefore you shall put a line under, hus, 3. And the like line also under 8, setting or pulling down under them their own Namemorre that is, 2 under 3, and also I under 8, sappeareth in the example, which numerators for a generall rule evermore to be pulled down fcultome in fight, to multiply the one by the ther, according to the tenour of the Rule of Thee. Then I multiply the one by the other, aving, once 2 is two, which fignifieth 2 li. beof the nature and like denomination of the iddle number, which 2 li. is to be reduced nto frillings, otherwise it cannot be divided www first number 24.

Then dividing 40 by 24, the quotient bringthorth 13. So much is of an Ell worth after intrate. Otherwise although 2 mond could to be divided by 24, yet it might have been obreviated to 13 of a pound: which is worth

18.8 d. as before.

fion

then making a line roller 3 thus. 3 and line worder 8, that, 3 and pulling down their cach figure, rhat, inder 5, and 7 under 5, and 7 under 5, which as I fuld belief or a generall rule 3 pull downe of sultons.

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Second Question.

I F one pound of any weight cost 13 shillings 4 pence, what are 3 of the pound worth after than rate?

Answer. Reduce the 13 shillings 4 pence in to the parts of a pound : which is ; , and then will the question stand thus.

Tem, for the understanding of this, if you I mark well the last example, this and the rest lyeth open, and needs small instruction. For a you did last so again, bring the Denominators the second and third Fraction, unto the first figure I, multiplying the one into the other, which meketh also 24, your Divisor.

Then making a line under 3 thus, 3 and line under 8, thus, 8 and pulling downs their Numerators under each figure, that is under 5, and 7 under 8, which as I faid before for a generall rule I pull downe of custome if

fight

Note.

fight, to be the two numbers, that of duty ought to be multiplied together; which done, Ibing 2, being the leffer figure under 7, maltiplying them together, it maketh 14, which he of the nature of the middle number: that is wit, pounds, which 14 cannot aprly be diided among 24: therefore are reduced into fillings, as is plainly to be feen in the example: then 280 stillings parted among 24 yeeleth for his quorient ti s. 8 d. your delire, and mejalt price of 3 of an Ell. Otherwise 14, bugh it could not be divided by 24, might by diation or division in broken numbers have en divided or abbreviated to ?, which in efthe being reduced to his known parts, maketh fis. 8 d. as before. But my good will and maning is to aid young beginners: therefore live I reduced the 14 pound into Ibillings, thich is the easier way.

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Now followeth the Example.

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24		.3	280 (11	350
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		20	Z	,
osi -n	2,2120	280 s. 1	answer, 11	f

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The third Example.

If one yard cost me 25. 6 d. what 345;

Answer. First put 6 d. into the parts of a shilling, and then the question standeth thus:

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Item, to the ready understanding of this, and all fuch like, according as before hath been declared, bring the Denominators of the fecond and third Fractions unto the first place, multiplying them the one into the other, all which make 8 for the common Divisor. Then next reduce your fecond number; faying, two times 2 is 4, and I is 5; as was taught in the example aforesaid. Lastly, reduce your third number 345 - all into fourths, and they make 1881, which 1381 is to be multiplied by 5, according to the tenour of the Rule of three : which done, maketh 6905 s. and divided by 8, your Divisor yeeldeth in Quotient 863 5 s. which maketh in pounds 43 li. 3 s. 1 : and fo much are the 345 2 yards worth at that price.

The same question wrought again by two soillings 6 pence, is now converted into the parts of

pound; and standeth thus :

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Item, After I have brought here my fecond

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and third Denominator unto my first place, and sound 32 to be my Divisor, having thus smished my first place with all things unto him belonging (which is meant of bringing and multiplying the Denominators of the second and third Fractions into him) I then goe in hand to see what is to be done in my second place, where presently of custome I pull down my Numerator runders, being the figure in light that shall nultiply my third number.

Then lastly, I reduce 345 all into fourths as afore was practifed, which maketh 1381, the which 1381, I am to multiply by 1 my fecond number, they are nothing increased, but by the Metamerphosis of my work they are now 1381 pound, being of the nature of the middle number, as I have often shewed you, which divided by 32 my Divisor yeeldeth 43 pound, and which is of a pound reduced into known numbers, make 3 shillings 1 d. as before.

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Example.

Now follow foure other questions, which are in all three places broken numbers: or whole and broken together.

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Item,

Item, First for the finding out of your Divifor, you shall take this for a most certain, and generall rule: That you must multiply the New mentor of the first number in the question, by the Denominator of the second: And that Produst again by the Denominator of the third: And the totall thereof, shall be your Divisor.

Secondly, for a generall rule to find out your Dividend, multiply the Denominator of the fift number by the Numerator of the second, and the whole thereof by the Numerator of the third. And the totall thereof shall everyour

be your Dividend,

Now for an example, I propose this question thereby to make my meaning more plain, and to show you, as I have done in the nest, the manny and order of the work, which was a local to the manner.

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or 20 s. What are i of the like weight or modeling worth after that rate?

Example.

I Tem, For the more plainer understanding hereof, and all other the like, in broken Numbers: First, you shall pull down two, the Numbers of the first Number or Fraction, with a line under thus, 3 \(\frac{1}{2}\); that done are ding as you have learned before, bring 6, the Denominator of the second Fraction, and sets under

mder two, multiplying the one into the other, which maketh 12. Then laftly, bring 8, the Dengminator of the third Frattion, and fet it mder 12, multiplying that 12 by 8, which amounteth to 96, or else for more briefe, multiby 6 by 8, faying 6 times 8, makes 48, which If fet under 2, and multiply the one into the other, it maketh 96, as before. And this 96 is he first number in the Rule of three. That shall alwayes for a most general Rule be your Dirifor.

Secondly, to work for your Dividend, you hall, (as it hath been sufficiently declared bebre) pull downe 5, the Numerator of your fraction, and fet it under 6; with a line

mder, thus 6.

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That done (as you know) you are to pull lown 3, the Numerator of the third Fraction, nd fet it under 8, with a line under it, thus 8, ultiplying the one into the other, according whe tenour of the Rule of three; which wheth 15. Then according to my note, fornot to bring the Denominator of the fift fraction, which is 3, under 15, and multiwithem together, which maketh 45, which gis your Dividend, and are of the nature of Imomination of the middle number, as I have hight you before : And therefore are 44 li. he hich apely cannot be divided by 96. Theree you shall reduce the 45 li inco s. as you performed in the Example, which amounth to 900s, which divided by 96 your Dis vifor, Ii4

which in leffer termes is \$\frac{1}{2}\$: which \$\frac{1}{2}\$ in mony maketh \$\frac{1}{2}\$ d. and fo much will the aforefaid cost, as by the work following shall appear, and

The Example.

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	baid Ar	CONTRACTOR OF THE PARTY.	way ferty	11.

Otherwise though 45 could not be divided by 96, yet by Division in broken numbers in might have been abbreviated to \$5 of a pound, which reduced into known parts, will make 95, 4 \frac{1}{2} d. as before.

maker it moder S. Willia Live ande

Now my second example shall be the proof of this question.

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and you shall have your desire.

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Into him. which pakes 12 went Divided to Then the Noweman's of the fection of selfant is patied down; under 2 of cultime now it tights ready to making him third humber, be which is performed as 100; as the him third humber is so is reduced into has a Then is filly, I multiply that 1 88 10 or sale.

Then is filly, I multiply that 1 88 10 or sale.

Denomination of the forther was a celdent as a

Here as appeareth by the work, the multipliation being ended, 240 is to be divided by 188, which to fome perchance may feem hard; jet notwithflanding is the work good. Therebre abbreviate 240 by 288, as you fee here is practifed: and the end of your abbreviation hall come to 2 your defire, 240 12 13

Otherwise, 240 120 60 30 5

Otherwise,240 40 5 288 48 6

The third Question.

If 2 Ells cost 13 s-4d, what 156 2 Ells?

Answer. To work this question the shortest way: reduce 13s,4d, into the parts of a pound, which is 2.

Then as you did afore, after you have fet town the question, the Numerator of the first fraction 3 is pulled down under 4, and Denominators of the other, two fractions multiplied into

into him, which maketh ; 8, your Divisor:

Then the Numerators of the second fraction is pulled down, under 3 of custome now in fight, ready to multiply my third number, by which is performed as soon as the last numbers 156; is reduced into halfs.

Then lastly, I multiply that product by 4, the Denominator of the fraction: it yeeldeth 1504, which I divide by 18, and my quotient is 139 land; of a pound remaining, which is worth 2 send; of And so much will 1564 Ells confin by the work following doth appears.

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		1	CA 1.50 E. C. S	1/0.24		77 (48)
	Th	e four	th que	Stion.		

If 2 Ells coft 1 pounds, What cometh 29;

from, to the workmanship of this question, first reduce your second number in saying the times I is 3, and 2 is 5. Then bring the multiplication of the Denominators of the second and third Fractions which maketh 12: and multiple that 2 by 5 your fielt Numerator, and it maket 60, which is your Divisor.

is

Then the Reduction of the feeond number,

thich is 5, multiplied by 117 the product of elast numbers reduction, make 1885, which By yet resteth to be multiplied by 2, the denuvator of the Fraction in the first place, yeelch 1170, which divided by your Divifor 60 eldeth 14 pound, 10 s. as appeareth by the netrell, Teek the difference fostant and

Thus having now touched the 12 questions ereof I first pretended, which with diligence oft Practice, I crust are sufficient to aid the frous unrothe working of any broken hom-I will now intreat of divers necessary les incident unto traffick, as hereafter fol-

loweth.

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The fourth Chapter treateth of loffe and gain in the Trade of Merrosin toc poundalibrant: The quelle

Fone yard coft 6 s - 8d and the Ame is lold again for 8 s-6d. the question is, what is gained in 100 pounds laying out on fuch commodicies 20101 and 20

Infwer. The Rule of three direct, applied to mapper of wayes to doe the fame: The is to fay, If 6 give 81, what giveth Multiply and divide, and look what requotient bringeth forth above your ing out, is the nest gaines and folution

to your question. If you follow the workyour folution will bring forth 127 li. - 108. which is 27 li. - 108. more then your principall, and to much is gained in the 100 pounds laying

Item, to work it the other way, which I take the nearest, seek the difference betwixt the just price and the other price, which is one shilling ten pence, then fay by the rule of three,

If 6 s, gain 1 what shall 100 pound gain? Multiply and divide, and you fliall find 27 li. 10s, and fo much is gained in 100 li, laying is hereafter fao

You may use which of these two wayes you think good.

The proof. 10 a yard of cloth be delivered for 8 s. 6 d whereupon was gained after the rate of a7 li 10 s. in 100 pounds laying out : The question is, what the yard cost at the first hand?

Answer. Put your gain 27 li-10 s. to 100 pounds, all maketh 127 li-10s. Ther fay, If 127 li. 10s. give but a 100 pounds, wha giveth 84s? Work, and you shall find 6s. 8d the true folution to your question, ver. The Rale of three direct. 30

Yet another Baumple or Proof upon the first Question.

If one yard cost 65, 8 dithe question is,2 what price the same is to be fold again, for to gair

nin 27 li. 10 s. in 100 pounds laying out?

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Answer. Say by the Rule of three, if 100 li. in 127 li. 10 s, what giveth 6; s? Multiply divide, and you shall finde 8 s. 6 d. your true ution.

If one Ell cost 7 s. 8d. and be sold again for 6 d. The question is, What is gained in 20 ands laying out in such commodities,

Answer. Seek the difference betwixt the just ite, and the other price which is ten pence, and mapply the Rule of three, as before is taught, ing, If 7 \frac{2}{3}s. give \frac{2}{3} shillings; what giveth 20 \frac{1}{3} Multiply and divide, and you shall find 2 li.

The proof also by an example of losse.

Merchant hath bought Holland cloth at 8 s. 6 d. the Ell, which proveth not to his uttation, whereupon he is content to lose 2 li,3 a 20 pounds laying out. The question is, what wought to be made of the Cloth, abating this

Inswer. Doe as before in Gains hath been wht, putting 2 li. 3 11/15 s. to your 20 pound, ltogether, maketh 22 li. 3 11/15. Then say by Rule of three, If 22 li. 3 11/15 s, give but 20 l. hat shall come of 8 1/15? work, and you shall ale 7 s. 8 d. the just price that the Ell ought be sold for after the rate of this losse.

Thus

Thus it appeareth evidently, as in company the Rule is appliable as well to gain as loffe.

If 20 3 yards toft 30 li. 10 5, how shall I fell the fame again 3 of the principall, or to make of 3, 4. Which is all one?

Answer. By the Rale of three, if 3 doe give 4, what will 36 = give? Multiply and divide, and you shall find 48 = li. Then say again, if 20 1 yards do give 48 = pounds, as well principall as gain, what will one yard be worth at that price? Multiply and divide, and you shall find 2 li.

If one Ell of Cloth cost me 8 s. 8 d. and afterwards I fell 10 = Ells thereof for 5 li, 13 s.4 d. I would know, whether I win or luse: and how

much upon the 100 pounds of mony.

Answer. See first at 8 s. 8 d. the Ell, what 10 i Ells comes to, and you shall finde 4 li. 11 s. and I sold the same for 5 li—13 s—4d. so that I did gain upon the 10; Ells 22 shillings 4 d. Then if you would know how much is gained in 100 pounds, I say by the Rule of three, if 4 li—11 s. did gain 22 s—4d. what will 100 pounds gain? Multiply and divide, and you shall find 24 li—10 s—10 d. if and so much is gained in the 100 pound of mony.

If 12 ; pards cost me 11 pound five shillings, and I sell the yard again for 18 shillings, the question is whether I do win or tose, and how much in

or upon the pound of many?

As wer, Look what the 12 ; yards come to 10 s. the yard, and you shall find ten pound. But they cost 11 pound 5 shilling. So there is oft upon the whole 1 pound 5s. Then to know how much is lost in the pound, say by the Rule three, if 11; pound do lose 1; pound, what will 1 pound lose? Martiply and divide, and on shall find 2 s. 2d; and so much is lost in expound of mony.

If I fell the 100 weight of any commodity for yound, whereupon I doe lofe after ten pound in 100 pound, I demand how much I shall lofe or in the 100 li. if in case I had sold the same

4 pound ten Shillings.

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Answer. Say, if 90 pound yeeld 100, how uch will 4 give? Multiply and divide, and wishall finde 44. Then say again, if 44 give a 4 ½ what will 100 come to? Multiply and hide, and you shall find 101 pound ½ which more then 100 pound by 1 pound 5 shillers; and so much is gained in the 100 pound.

Merchant hath fold Currents for the sum 1430 pound, and he hath gained therein after upound in the 100 pound. The question is to whom much he gained in all.

Answer. Say by the Rule of three. If 100 and doe gaine ten pound, what will 430 and gaine? Multiply and divide, and you all find 43, and so much hath he gained in

Questions of

ne yard be worth 28; s. for how much hall 10 yards be fold to gain after 8 li, 6 s, 8 d. in the 100 pounds?

Answer. First, adde 8 li—6s—8 d.to 100. Then say, if 100 li.do give 108; s. for principall and gain, what will 28; s. principall yeeld? Multiply and divide, and you shall find 30; s. Then say, again, by the Rule of three, if 1 yard do give 30; s. (which is as well the principall as the gain) what shall ten yards give? Multiply and divide, and you shall find 15 li.8 s.9 d. And for the same price shall the ten yards be sold, for to gain after the rate of 8 li.—6s.—8 d. upon the 100.

Abranch or proof out of this bas vignality of this bas vignality Question.

A Merchant bath sold clothes for 15 li-8s—
9d. and he hath gained in the whole the summe of
1 li.—3s.—9d. The question is, to know how
much he hath gained in the 100 pound?

Answer. To know this, first rebate the gains from the price, and there will remain 14 li. 5 s. 0 d. Then say by the Rule of three direct, if 14 li. 2 give me 1 li. 3 \(\frac{3}{2}\). What will 100 li give? Multiply and divide, and you shall find 8 li. 6 s. 8 d. the effect desired, the proof is apparent in the question before.

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ugon is gained after 10 li, in the 100. The our et another branch or proofe of the Amare. Till golfado Other 11 15 16 what one yard? Muluphy and divide, and you Mendyards be delivered for ag his & sold at mangen was unined after sheraterof 8 listos disposition dos pound; the question is probat the ges, the jult prict band fait darda forbib h Infwer. First, fay by the Rule of Three, iften! th principall and gain yeeld 15 li.8 s. 4 shilgs, what dhalf riverid? Mulciply and divide, wenthall find to a suThen fayldgain, by then lebf Three in so 8 Principall and gain give mood what shall go is af principall and in yeeld? Work, and you shall findows to fo much did the yard cost at the first peny. cone yand ouff. 36 sil both much fall 12 yards old for account after their att of ten livil the s what shall 100 give? Mudtiply and Jufwerls bittliffap I flappleive and lispriniv Landig ain; what will go sogive? Mulophy divide, and you shall finde 39 s. Then fay in by thousaile of Three It and yard of prinilland gain yeeld go thullings, what that ards gain? Multiply and divide; and you finde 23 li. 15 &s. which &s. in known mber, is 2 ; d. And for the same price shall 12 yards be fold, to gain after the rate of nthe 100.

The Proof.

If 12 yards be fold for 23 li. 152 ? d. where-

Queftions of loffe, lecc.

upon is gained after 10 li, in the 100. The que-

Answer. First say If O2 pine 23 li. 15 to. what one yard? Multiply and divide, and you Atal find 34 28. Then fay again by the lotte of threat af a so pounds give but a room water Balled not done stable from a feeled to be stabled to the feel to be stabled to be stabl

who whee ball and gain yeeld 15 li.8 s. 2 hil-Ibent When and Merchant feller b : mines rol andohed, and her invest to the payer it lis 6 . Sides upon the spokes on 20 ti. The question to, How mond fhall the buyer gain apon the 100 la offer gain veeld? Work, and you finall fing our that And so much did the yard cost at the first peny.

Anfwert First adde t lie ds. 8d unte odie. and they are as to Then fay, If ac pound give 214, what shall 100 give? Multiply and dot vide, and you that find 1.061 180 the theter citidountly airquellat wid mer. schrenk docatog

Gentleb Reader, beher necelfully quellions appearaiding, and Lolle and Gaine you shatte have in the eight Chaptelof this Treatibes to hall node 23 li. 15 ; s. which; s. in known number, is a ; d. And for the same price shall

the varids be fold, to gain after the rate of

Flagards be fold for 23 11. 152 ; nogu

Roor I so

Colegand for all others, more rejoycechin

he fift Chapter entreateth of Lotte and Gain upon time, wrought by the double tule of Three, or by the Rule composed: which is contained in four speciall feected branches, or questions of divers formes, each one of them fringing from the first question, and each one of them also being a proof to other, &c. ...

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Fone yard cost me 2 s. 8 d. ready money; and after I fall the same again for 2 s. 1 o d. to be paid for it at the end of three months: the question is, what I gain upon the distribution to district 12 monethis

oferen First fay, if 2 | gain A what shall ligain? Multiply and divide; and you shall 6 1 li. Then fay again, by the Rule of three; free months gain 64 pound, what shall 12 eths gain ? Work, and you shall find 25 li. to much shall I gain in 12 monoths after rime, if 106 2 lisgive bue 100, what, staff

from may alfo work it all ac one workby the first part of the Rule of the compofaying, if 2 & d. in three months do gain ? Millings (which is z d.) what will 100 li. in 12 monethis? Which for thy further eningement, the work of this one example I have

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have here pur down, to verific that I affirme in the first part of the Grandle flatte the the Role, and fo all others, more rejoyceth in Bro-The file Chapter entrearched the nate tak Gain upon time, wrought by the double three, or by the Rail composed which de contained in four freciall & lefted aranches, or questions of divers formes, sach one of them principaging the hope of ion and she waste the total 144 1448 49910 01 loore a thied olla

Let Fone pard coft me 2.5. 8 diredde am Where the multiplication and the dis being ended, makether lingour delite sit at the end of three monelis; the

on If a gard be delivered for 2 5, 1 6 th at 3 moneths, whereupon with wained after thera of 25 li in therioo for to manathil the question lishow, what the jurid coft at que fo ft band al to ind 6 11. Then fay again, by the Rule of three,

1 Mafmeriv Fift fay; If a zimonethe gains what fhall a moneth signif Work, and yo Thall finde 94 li : Then fay tigain the dedon time, if 106 i li, give but 100, what shalls give? Work, and you fold finder si8d which is the just price that the yard coll at the fi ed, laying, if 2 & d. in three months dobnad & . I of oney and of Clother offiche 25. 8 di no -money for what term fall in fell the fami ug

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point approbe 100 pound in 12 monents?

Los free. Firthful, if 2 apain free half copound gains Multiply and divide, and you all finds of pound. Then fay again, for the fond work, of 29 pound be come of 12 house he what half come of 64 ? Work, and you do finde there moneths, the just terms of the that the Clothought to be delivered at the dive gain 25 pound upon the 100 h. It moneths! he wind a pound upon the 100 h.

If one yard cost me 2 5. 8 d. ready money, for at price shall I sell the same again to be paid at and of three-moneths, so that I may gain after reate of 25 pound in the 100 pound for 12 oths?

oneths gain? Multiply and divide and you finde 6 to Then fay for the fecond to if 100 lie give 106 what giveth Work, and you shall finde 2 s. 10 d. for that price must the yard be sold to gain 25 pound in the 100 pound for twelve meths.

liny other of these questions I might here delivered, but for search the Book would to too thick a volume, and so to make the to much the dearer, whereby it might be so portable to my Countrimen as I hit. But these 4 I have of purpose framed its order, having relation one to another; ting you that what question soever may toposed within the compasse of this Rule Kk 3

vou thall finde by one of the le sto make afor fution. And morcover, divers others are yet to be delivered, where the Creditor givethis vers dayes of payment, which can never be well wrought, nor yet understood, unleffe vo wan first find by Age the just cimes that all those payments, how different foever they be ought to be paid at once : whereupon first I think good here to give fome inftructions unto fuch a Rule, for it is the onely aid for the finishing offuch questions as hereafter shall follow. what orice hall I letting time again to be gaid at

The fixth Chapter intreasesh of Rules of payment, which is a right necessary Rule, and one of the chiefest hand maids that attendeth upon buying and felling, &c. adforehit price male the va

in the 100 pound for twelve Example.

Be Merchant doth one a fumme money, whereof the fis to be par I at fix monerhs, and the ; at elgh moneths, and the rest arayeur. the question is subut time ought to be given him Answer. I have omitted the quantity ofth

furnine, for you that understand the Rule

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appliable, and yeeldeth a true for intion to what famme foever thall be proposed a But now for order lake in teaching. I doe imagine the lim to be bopounds, where pan the manner of this work is to multiply the propolitionate white of the money by the time as in company. Then so being the fielt payment and theus of 160, which i multiplied in broken numbers by it, in sime of payment maketh is which in she operation was appropriate and a Monether the concentration was a portation of the Monether the two moneths next of the Monether which is the t muland it veelderh one manh settanom sallon he rest which is to distribute a la second anit needs be abbreviated into the proportion beareth to 600 which is to which the multiplied by his time 12 moneths, producerhame keth two moneths. All which added together, appeareth in the operation, maketh eight moneths, which is the just time that all these payments ought to be paid at once.

my ood of one. The sicopredict obtained the sicopredict of the state of the maner of the sicopredict of the state of the sicopredict of the sicopredict of the maner of the mould pay all at one paiment. What time ought to be given him? I not a reliance of the would pay all at one paiment.

semble where is to gay 600 pound is that seems must

appliable and pendin by test afforced what is for the condensate in the state of the condensate in the condensate of the evont did before maket hy then might a so or work is so much and an area proportion of the contract of the which maliplifishm somes wove your in untill you have longht what proportion it beareth to Soo pounds. Therefore you mist subtract the ready money, the 4 and 4 out of the principall. The rest will be 66 \$10. which you must look what part it bearest to the pincipall, which you hall finde as Bey, the line you mult also multiply by the time x2 months, and it yeeldeth one monochantonatt make at the renorming of the histories as a specifican -il Merchantes to pay 1200 A. in three termis,

thuis to wiry 400 hi at two weeks ! and bed !!. author moneths diapely coolings five months The question is showhar time they onghe to be paid moneths, which is the just time that allowed of

Answer Proportionate the parts, and you shall finde that 400 is a part, and for 600 you shall finde ; and likewife 200 is the bart, twhich mulciply by their times ha before and you that have ; weeks, more right weeks, and lastly 3 " weeks, which together maketh to weeks, or three moneths, vour defired of 10 BM

A Merchant is to pay 600 pound in three swines, whereof 100 pound is paid prefent, more ged poidd secretary days, daidthe e place got and the got and the got thinks the got to a modern. The quefour without time player the payments to be paid to once ? " a charle mos souls for

moneths doe game 2 s. what will be 2

he seventh Chapter intreaceth of buying and selling in the Trade of Merchandize, wherein is taken part ready
money, and divers dayes of payment
given for the rest, and what is wonne
or lost in the 100 pound for bearance
for 12 moneths mote or lesse, according to the quantity of money, or proportion of time, &c.

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Merchant bath bought fatins which cost eight swillings the yard ready mony: and he selleth the same again to another man for 10s. the yard, but he giveth dayes for the payment, that is to say, three with s for the one half, and sve moneths for the hulfe. The question is to know how much sellet doth gain upon the 100 stars 12 moneths with that rute.

Answer, Seek first by the Rules of pay-

anjust. Seek first by the Rules of payht, at what time those two payments ought be paid at once, and you that finds four

moneths.

Quelipage of behing

impright at which time the desort Merchant ought to have gold showholn entire payment: And the respecting by the integer of the fine and the respective and the state of t die gein in a zome to dente de alegaco frette

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money, and myest saussella Proposition do Motiply and disac, and you half finde 75 pounds decoppedated in the example, and fo much doch the first decrebant gain apporte

vanora Merchant bath fold so Clothes at 9 il. the piece, to be paid the one; at foure moneths, The bar feet minester and the hat feven moveths, di andabe fellersimple in to take no more but after from to done what the ho of on a a rounaths. The que-bion to done what the first Marchent gamesh in the side of shele Clothet after about rate.

company first look what the 50 Clothes companies that garg, and specifial find 476 pounds. Then secondly, according to your distance with the second rection in the Rules of payment, feek at wha timeal the payments are to be performed a once And you that finde 4 a monethe Th thirdly day, by the first part of the Rule of the com

what will 475 li gain in 12 moneths gain 8 liwhat will 475 li gain in 43 moneths? Work, and you shall finde 15 list and the of a pound, which is the neat gains that the full Meschant baths fter the rate a fore ide finish wouldn't

the Ell ready money, and the falleth the father or gain for 828.4 d. the Ell, to be paid in part in ready money, more is part at 2 months, and the reft at 4 months of The question is named how much the first Merchant doth gain upon the 100 pounds in 12 months after that rate?

Anfiners According to the direction deliveredyou is the Rule of payment, the ready money is not to be multiplied. Then working for the other two payments to finde out the true roportion at what time they ought to be paid conce, you shall finde for at two moveths, of a moneth. And the rest of the money thich is a multiplied by his term 4 moneths, reldeth in moneths, both which added togehermake 2 - moneths, the just time that both he payments ought to be performed at once. and therefore lay by the first part of the rule of bree composed, if 744 in 24 monethe do gain of a pound, what that to a pounds gain in 2 moneths after that rate ? Work, and you hall finde 7812 pounds. And to much doth regain upon 100 pounds in 12 months il

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A Morchine bath bought 30 Glothes at 6 points she piece for readyminey? Afterward he fellesh sen of them for 7 paints he piece for three moneths

ichter de grand ber bei ber endere Bele To Broken he poster for a montres stime of a montres of the string of th

clockes, which amount to 180 pounds, Secondly, feek what the ten pieces tome to an a pounds, and what the twency pieces come to at 80 pounds the one comesto 70, and the other to 160, both which together make 230, which is 50 pounds more then they coll. Thirdly, as I have raught you'm the Rule of payment, proportionate the first and second prices into the proportion they beare unto a ye the product of their two prices, and you that finde, for the first, and if for the latter. Then fourthly, multiply choic parts by their small and on their have it and it both veniche ogether makern three whole months, and to of amoneth, which is the pull time that both those payments ought to be paid at once.

Then by by the first part of the Rule of three composed; if \$80 pounds in \$27 moneths do gain yo pounds, what that I roz gain in twelve monethed Mutriply and divide, unit you fiall Sode gott pound, and so much dorth he gain 12 monesitismom sylswamishinoquoon inoqu

1104 Merchine hath bough Common which coft bing shillings the pound ready money. The question is now, as what price belowed to fell the Too weight. To wis, Tit 2 pounds to be puid the ar raw monethy hand she refeder ut the end of three

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ree mouths. Co that he may gain after the rate Answer Seek fielt by the Kales of payment what term both the payments ought to be id at once, where the a multiplied by his money where the a multiplied by his is two mouse he makerus moneibe and Likewije the next payment, which is multiplied by his pinably are seen there mobile the makerus makerus oneths, both which added together makerus makerus where is the time, that dock the ymenes ought to be paid at once. Then fay the Kele of the control of the moneths document in pounds, who will at monethe give the pounds, who will at monethe give the pounds. Then fay again maker Kele of the control of the pounds. Then fay again maker Kele of the control of the pounds. ounds. Then lay again by the Rule of three one pound coft me os what will III pounds it is Multiply and disame and you shak finde it. 8s. Then lay once again: If as a pound of give ready, what will so plantage at a large and so that what and so that index distributed in the population and for that write magnet po tell populations mented be part at increoverall payments aforelaid, so going shoreby the riche when of temporation appossible imported and in twelve moneths. and in cwelve moneths. How bang and mechage the wine house of the pound wor Shape His Pounds did on & pounds. Aconocyine, at while phicalin on the configuration.

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raider once, where the ; multiplied by his I Tem, Who that pulsipliath the pence that one pandemighens month by 7, and dividesh the products have suffered finds bow many pounds in money 1.2 poundwighbis worth. dood ed monom

Add charter wife; he shin multiplicab the pondashat 112 poundi theight is moreh by 15. and divider by the product by 7. Soul findle bon mary gentr in money the one pounts weigh in Multiply and divide, and you thall findedarow

pounds. Then fay significatine Rule of three, Hone bound cost me 9s. what will 112 pounds

Att de pencethe posted weight with the so h 8 s. Then tay one daysow the say chande

Aufwhow Multiply liwby 7, and thereof commeth griffit which divided by re, and you shall finde of spoonds. And this the was pounds it worth de his ta sq a dos from the mated of some acc leverall payments atorelaidiaidorelabninocent

And pounds the strappunds weight what is

one pound worth? Adjanom sylaws ni baseq. Multiply 6 by 15, and thereof commeth 90, the which divide by 7, and you shall finde 12 d. So much is one pound worth when the 112 pounds did coft 6 pounds.

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And for Jo much final the 754 pound befor

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the eight Chapten interesteth of Tages and allowinger of Merchandize Fold by white string bine shills and gainer of the any take into which descriptory the revenue country in the Topy our it the the philosoft finds



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Tro pound the 100 Suttle. what histrags pount Sixthe be worth, in giving a pound weight upon every 100 for Treat?

Answer Adde A winto 100 and job fall bare 102.

H toube worth 16 nounds, what are boy a sworth? Muttiply and alvide, and for that 257 H. 13 3.10 3 d. The former fally to possed weight be north, in the what that the pound be worth, in giving A gounds

the upon every hundred for Treat?

Inswer. See first by the Rule of Three What roo pound is worth, saying, if one cost what i co ? Makiply and divide, and you? finde 16 pounds. Then adde 4 unto one of and they are 104. Then lay again by the how much that 754 the fold for? Multiply wide and you high find 120 lists s. 37rd.

And

Tares and allowances.

And for so much shall the 754 pound be sold for at 3 . 4 d. the pound, in giving 4 months like 100.

2 Acher hacelfary hotal Rales shake are for stall finding of Tremo, no suffing up of Cheffs of Sugar, Security for this is a my floring from it if any lack instruction that mays they shall finde me ready to pleasure them.

And here of the word the roo Succeeding the state of the work of the word of the word of the word of the spand of the word of the spand of the word of

commeth 3440 the which divide by too, and there you that! have \$4.7 pounds, abate 84.7 from 800, and there, will remain. So it pounds Themtay, by the Rule of three. If (100 pounds only \$4.7 will seeman. So it in the pounds only \$4.7 will seeman. If (100 pounds only \$4.7 will see a colt after that care it will play and divide, and you that finde to the seeman so it is to be a colt in repairing four pounds upon every hundred for tare and clothe 101 beatout you no upon the seeman weight the seeman will be a colt in the seeman supon every hundred for tare and clothe 101 beatout you no upon the seeman weight the seeman will be the seeman

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pounds on top, given 104 on 109, And he which reduced and pounds opposite the 100 given the 100 given the 100 given the 100 gor pounds opposite the 100 gor po. Therefore lay by the 1844 in three,

the, if 104 be delivered for 100, for how such shall the 100 be delivered? Multiply and divide, and you shall sinde 96 \(\frac{2}{17}\), and he such rebateth 4 in the 100, maketh but 96 ounds of 100, so that he loseth 4 pounds in the 100, and the other which giveth 4 pounds ton the 100 loseth but 3 \(\frac{1}{17}\) pounds upon the 100. Thus you may see, that he which rebateth pounds in the 100, loseth more by \(\frac{1}{17}\) pound the 100 pounds, then the other which gave bounds upon the 100, for tare and closse.

from pounds of any thing cost me 23 s.4d. question is, how I shall sell the pound, to after the rate of ten pounds, upon the pound.

Infiver. Say by the Rule of three, if 100 inds give 100 pounds, what shall 23 \(\frac{1}{2}\) s give? Itiply and divide, and you shall finde 1\(\frac{1}{2}\) unds. Then say again, if 100 pound be worth pounds, what is one pound worth? Muland divide, and you shall find 3 d. \(\frac{1}{2}\) And much is the pound worth in gaining ten unds upon the 100.

Item, A Grocer hath bought C. weight of comlity for 6 li. 10 s. The question is now to know many pounds thereof he shall sell for 33s.4d. ain 20 s, in C. weight.

Answer. Adde 20 s, unto 6 li. 10 s, and they
L 1 make

make 7 li. 10 s. Then fay, if 7 s pound yeeld me 112 pound, what shall 1 s pounds yeeld Multiply and divide, and you shall find 24 s. And so many pound ought he to fell to gas 20 s. in his C, weight.

If one pound weight cost 3 s. 4 d. and I set the same again for 4 s. what is gained in a hundred pound of mony laid out in that commoding

Answer. You may say, If 3 s, give 4, what will 100 pound gain? But then when you have found, you must subtract 100 pounds out of the Product, the rest is your neat gain: or else to produce the neat gain in your work at the fall Subtract the just price out of the overprice, a I taught before in the first beginning of Loss and Gain, and your conclusion shall be allone Multiply and divide, by which of the two wayes you think good, and you shall find that he gaineth 20 pounds in the 100 pounds.

Item, If the pound weight which cost 4 she fol again for 3 s. -4 d. I demand what is lost in the 100 pounds of mony,

Answer. Say, If 4 s. lose 3 s. what shall so lose? Multiply and divide, and you shall find 16 li. 13s.4d. and so much is lost upon these of mony.

Item, If C. weight of any commodity coft pounds, and the buyer repenting, would tose for

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mends in the 100 of mony, I demand how the monds may be fold, his loss to be neither more in lesse then after the rate aforesaid of sive by the hundred?

Answer. By the Rule of three, if 100 lofe 5, hat shall 45 lose? Work, and you shall finde pound, which rebated from the principall 5, resteth 42 l. 15 s. Lastly say, if 112 yeels hour 42 li. 15 s. What one pound? Multiply divide, and you shall find 7 s. 7 d. 12. And much is the pound worth after that loss.

Agrocer bath bought three pieces of Raisins, ighing 175 & pounds, 182 & pounds : 194 ands: tare for each fraile 2 & pounds, as 25 the C. weight. The question is, what they want to in mony?

Tanswer 6 11 3 5. 4 17 d.

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AGrocer hath bought three facks of Almonds
whing 267 = pound, tare two pound, 257 =

the tare 2 = pound, 252 pound, tare 3 pound,

11, 10 = do the pound, what amount they to in

Inswer, t roli, 125, 3 4 d.

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The ninth Chapter intreateth of lengths and breadths of Arras and other Clothes, with other questions incident unto length and breadth.

Him piece of Arras bee 7 Elles and plong, and 5 Elles and 5 broad, how many Elles square doth the same piece containe?

of refresh as Large St. Laftly fay, if its veci-

that is to fay, 72 by 53 And thereof will come and Elles for many Elles fquare doth the fame piece contain.

Item, more, a piece of Arras doth contain 11
Elles square, and if the same were in length 3;
Elles, I demand how many Elles in breadth the

commeth 6 13 So many Ells doch the fare contain in breadth.

Item, more, a Merchant hather a Elles of he ras, at 1 a Elles broad, which he will change with another man for a piece of Arras, that is a Elles square. The question is, how many Elles of the squarenesse ought the first Merchant to have!

Answer

Aufwer. Multiply the first Merchants piece, is length by the breadth, and you shall finde, it containes the state Els, which is Els you shall dide by sand you shall find 6 is Els, and so many Els of that squarenesse ought the latter lerchant to give the first.

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Item, A Student bath bought 3 - yards of broad with, at 7 quarters broad, to make a gown, and sald line the same throughout with Lamb at a square each skin: the question is now how many thins be ought to have?

Answer. Seek first the number of yards mare that his cloth containeth, which to doe, mitiply 3 ! his length, by 1 ? his breadth, and on shall finde 6 ! yards square: then say by the Rule of three, it one yard square give 9 toot, that shall 6 ?? Work, and you shall find 55 ?

Item, more, a Lawyer bath a rich piece of seein come home which is 24 foot and 3 inches long, and foot and 2; inches high: the foyner is to analy by the yard square: the question is, how any yards this containeth?

An/wer. Multiply his length by his breadth, but is to wit, 24½ foot by 7½ foot, and you hall find 174¾ foot square, which 174 you hall divide by 9(for so many foot make a yard ware) and you shall finde 19 yards 3 foo the L1 2 and

and 3 of a foot, and to many yards doth this piece hold.

Item, bought a piece of Holland cloth continuing 36 Els; Flemmish. The question is how many Ells English it makes.

Answer. You must note, that five Ells Flem.

mif doth make but three Ells English.

Therefore say by the Rule of three, if five Ells Flemmish make but three Ells of English how many Ells English will 36 \(\frac{1}{2} \) Ells Flemmish make? Multiply and divide, and you shall finde 21 \(\frac{1}{2} \) and so many English doth 36 \(\frac{1}{2} \) Ells Flemmish contain. The like is to be done of others.

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Item, more, I have bought 342 Ells Flemmb, of Arras work, at two Ells broad Flemmis, and I would line the same with Ell broad Canvas of English measure. The question is, how many Ells English will serve my turn?

Answer. For as much as three Ells Bogille are worth five Ells Flemmis, therefore put three Ells English into his square, in maniplying three by himselfe, which maketh nine. Likewise multiply the English Ell, which stive quarters, every way into himself squares, and you shall finde 25. Then multiply as which is the length of the piece, by 2, which is the breadth, and thereof commeth 684.thm

house of Flemmish measure, be worth nine Ells house of English measure, what are 684 of themish measure? Multiply and divide, and so shall finde 246 & Ells English.

The same is also wrought by the Backer the of three, in seeking the squares contained othe Flemmish Ell of two Ells broad (which with and also in seeking the squares contained in the English Ell (which are 25) then say the Rule of three backward, If 18 quarters mire 342 Ells, what shall 25 quarters give? This play and divide by the Rule of three Reme, and you shall find as before 246 f Ells wish?

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hom, more, at three shillings four e pence the homish Ell, what is the English Ell worth af-

Adwer. Say, If three quarters give 3 ; s. hat giveth five quarters? Multiply and dide, and you shall finde 5 s. 6 ; d.

Item, more, at 8 s. 4 d. the Flemmish Ell worth after that

Answer. According to the reason of the last pestion, consider that a Flemmish Ell square equals to nine quarters of a yard English, and

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an English Ell square is equal to 25 quatters of a yard. Therefore say by the Rule of three if 9 quarters give 1 \(\frac{7}{2}\) s. what 25 quarters ? Work and find 23 s. 1 \(\frac{7}{2}\) pence. And so is the English Ell worth.

Item, more, at 6 s, 8 d. the Ellsquare: what shall a piece of Cloth cost that is 7 s Ells long and 3 h Ells broad?

Answer. Multiply the breadth by the length, and you shall finde 24 ? Ells square cost 6; h what 24? Ells? Multiply and divide, and you shall find 8 pounds, 2 s. 6 pence, and so much the same piece of cloth cost.

Item, more, a Mercer sold 3 pieces of Silk Te mit 24 \(\frac{1}{4}}\) 13 \(\frac{2}{3}\) and 25 yards, at 9 \(\frac{1}{4}}\) 5, the yard, and mas glad to receive in part of payment again, a cloth containing 34 \(\frac{1}{4}}\) yards at 7 \(\frac{2}{3}\) shillings the yard. The question is now, what the Debter un the Creditors debt? Work, and you shall sind be oweth the Mercer 22 pounds, 3 shillings, 1; pence.

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The tenth Chapter intreateth of reducing of Pawns of Geanes into English yards.



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Ote that 100 Pawnes doe make 26 yards, whereupon three Pawnes ; doe make one yard, and one Pawn after the rate and proportion is ; of a yard.

In 4563 Pawnes of Geanes, how many yards English?

Answer. Say by the Rule of three, if a hundred Pawns doe make 26 yards, what will 4563 Pawns make? Multiply and divide, and you hall find 1186 yards 3. So many yards do 4563 Pawns make.

Otherwise, take some other number at your pleasure, as ten pawns, which is the it part of 100, then to find his proportion, take the it part of 26, which is 2% and then say also by the Rule of three, if ten Pawns give 2% yards, what will 4563 Pawns give? Work, and you shall and 1186% yards, as before.

More, at 2 5.6 d. the Pawns of Geans, what

will the English yard be worth after the rate?

Answer. Say by the Rule of three, if it of a yard cost 2 is. what one yard? Multiply and divide, and you shall find 9 s. 7 is d.

More, if 346 ? Pannes cost 30 li. 13 5. 4d. sterling, what is that the English yard after the rate?

Answer. Say by the Rule of three, if 346; Pawns cost 30; pounds, what are 3; Pawns worth (for so many Pawns make a yard?) Motiply and divide, and you shall find (371) parts of a pound, which in known numbers is worth 6 s. 9 d. 3275.

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The eleventh Chapter intreateth of Rules of Loan and Interest, with certain necessary questions and proofs incident thereunto, &c.

Tem, I last my friend 326 pounds for 5 is moneths simply without an Interest, upon condition, to have the like courseste agains when I need, But when I came to borrow, he could spare we but 149 li. 85. 4 d. The question is now how

how long time I ought to have the use thereof, to countervaile my friendship before time shewed him?

Answer. Say by the backer Rule of three, if 326 pounds give 5; months, what time will 149; pounds give? Multiply and divide, and you shall finde twelve months, and so long time ought I to use his mony.

The Proofe.

Item, lent my friend 149 li. 85,4 d. for twelve wonths. The question is now how much mony he wight to lend me again for 5; months to recompense my friendship shewed him?

Answer. Say by the Backer or Reverse Rule of three. If twelve months give 149 3 what shall 5 1 months give? Work, and you shall find 326 pounds, and so much ought he to lend me to requite my gentlenesse or good turn.

Two other branches, yet more, for proofe out of the same question

Item, lent my friend 149 li. 8 s. 4 d. for 12 wonths, to have the tike friendship again when I wood. And comming to borrow of him, he very worteously took me 326 pounds (for that he could well then spare the same) The question is now, how long I ought to occupy it, not usurping friendship, but in his due time to restore it again.

Answer.

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Answer. Say by the Rule of three reverse, if 149 % pounds give 12 months, what shall 326 pounds give? Multiply and divide, and you shall finde, that at 5 % months terme, I ought to restore it again.

Proofe.

nonths. The question is now, bow many pounds he ought to lend me for 12 months to recompense this pleasure again?

Scholar. Work by the Rule of three reverse, as you have done before, and you shall finde 149 li—8s—4d.

Again, four other selected questions, of Loan and Interest, all out of one branch, and each one also a necessary question, and a particular proofe to other.

ITem, Lent my friend 430 pounds at Intent for three months, to receive after the nat of 8 pounds in the 100 pounds for 12 months The question is, what the interest commeth to !

You may if you please, work it at two workings by the Rule of three direct, in saying, if n

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months? Multiply and divide; and it giveth 2

pound.

million for the second work say: If a hundred pound yeeld a pounds, what yeeldeth 430 He Multiply and divide, and you shall finde 8 lives; and so much comes the loane of 430 Hz to for 3 months after the rate of 8 pounds in the hundred pounds of 12 months.

Otherwise wrought thus by the rule of three

at twice also,

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If 100 pound give 8 pounds, what giveth 430 pounds? Multiply and divide, and you hall find 34 pounds? Then again for the second work say: If 12 months give 34 pounds what giveth three months? Work and finde 811, 12 s. as before:

Otherwise yet at one working: By the first pure of the rule of five numbers forward, in hing, if 100 pounds in 12 months, gain 8 pounds, what shall 430 pounds gain in three months? Multiply the first by the second for rout Divisor, and the other three, the one into the other for the Dividend, and you shall find eight pounds 12 shillings, as aforesaid.

Then again for the Kooning vork fay, if 34

Item, A friend of mine received of me 8 pounds
to billings for the Interest and Vse of 430
punds for three months terme: The question is

now; what he tooks in the 100 pound for sa manths of serabst rate to bas a line was distant

Answer. For most brief, say by the full part or sulc of five numbers forward s. If 470 pounds in three months did pay 8 li 121 what doth 100 pounds in 12 months take afor the sate Worksand you thall find 8 pounds and fo much he sook upon the 100 pounds for 0.h rwife wi one he that by the rail of me was 1.0

If you pound give & pounds, what giverh un Athird Queltion and proof alfo by - 1 of the Backet Rule of five as builded al anog provig = Numbers, 11 yet 210 mbres

what giveth there months? Work and finde Tem, I lent my friend 430 pounds to receive for the interest thereof, after the rute of 8 pounds in the 100 for 12 minuths. The question is now how long time my friend onghe to give the afe thereof, that it may be returned with 8 li months? Whiteply the hill by the maingle 84

Vou may work it, if you please by the Rule of three direct activice, in Taying : If ion li yeeld 8 pounds, what yeeldeth 430 pound? Multiply and divide, and find 34 pound and

Then again for the second work fay, if 34 pounds, give twelve months, what giveth 8; pounds? Multiply and divide, and you shall find three months, and fo long time ought of friend to we is to return with 8 li .- 12 s.gin.

Otherwise at one working by the Backs

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Rule of 5 numbers, in faying 1 if 100 pounds in 12 moneths doc gain 8 pounds, how much time shall 430 pounds be a gaining of 8 pounds 125. 7 Multiply the first and the second into the last for your Dividend, and the third and fourth multiply together for your Divisor, and then divide, and you shall find three months, the just time that my friend ought to use it to return it with 8 light as gain.

A fourth derived question out of this Branch, which is a proof of this last, and also of the other two going before.

the case foliation to your auchion.

Item, How much mony ought a Merchant to deliver after 8 pounds in the 100 for twelve months, that in three months he may gain 8 littleve shillings.

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cker Rule Answer. You may also if you please, work it by the Golden Rule of three at twice; left saying, If three months give 8 pound, what 12 months gain? You shall finde 34 if then say again, If 8 pounds be come of 100 pounds, what shall come of 34 li. 8 2? Work, and you shall finde the answer to the question, which is 430 pounds, and so much ought the deschant to deliver.

But most briefly it is answered by the Backer lale of 5 numbers, where I argue thus, saying:

If

If 100 li. be 12 months 2 gaining of 8 his then but for three months terme onely to take 8 li. 125 must needs be a good round fumme to work it; fett your numbers thus 100—12—8 multiplying the first into the second, and also by 43 the product of the fifth for your dividend, and the third and fourth together with 5, the Denominator of your fraction for your Divisors then divide, and you shall find as before 430 pounds: the true solution to your question.

The swelfth Chapter intreatesh of the making of Factors, which is taken in two forts.

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He first is, when the estimation of the Factor is taken upon the fending of the Merchant, as if the estimation of his person be the estimation of his person be the pain, the Merchant the other?

The other fort is, when the estimation of his making is out of the sending of the Merchant, as if the order and agreement between them were such, that the Merchant shall put in 800 li. and the Factor for his making shall have neverthelesse he shall have but; of the guir

er profit, for the 2 of 800 is 200 (for the chimation of his making) which with the 800 nounds in all make 1000 pounds, whereof the

200 pound, is +

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A Merchant doth put in 800 pound into the ands of his Factor, under fuch condition, hit the faid Factor shall have the ! And after creain time they finde in profit 124 li.6 s.8 d. Idemand how much the Merchant shall have bereof, and how much ought the Factor to hive? has visited to

Answer. When the estimation of the Factor is ust of the sending of the Merchant, it maketh,

But if that his estimation be at the fending of the Merchant, then it maketh but die W the Merchant unter 13 0

For the Merchant is then to have 1, and the alfohe between Merchan

A Merchant doth put into the hands of his fictor 800 pounds, and the Factor 400 lis Mm to now for how much his person is esteemed, when the same is counted upon the sending of the Merchant.

Answer. Ascerding to the tenour and order before prescribed in the first Rute, that is, if his estimate be in the shall have the if of the gain. Therefore say by the Rule of three direct: If taken pine in a00 pound, what is the estimate, in putting in of it taking? Multiply and divide, and you shall finde 320 pounds, and so much is the person of the Factor estimated.

Otherwise.

To finde the estimation of the person of the Factor, you shall consider, that seeing it was agreed between them, that the Factor should take the fine them, the Merchant shall have the residue, which ate as wherefore the gain of the Merchant unto that of the Factor is in such proportion as 5 unto 4. Then if you will know the estimation of the person of the sector, say, If 5 give 4, what will 400 give? Multiply and divide, and you shall sinde 300 pound. And so much is the person of the sector esteemed to be worth.

Other conditions then these aforesaid, and also be between Merchants and Factors, without respect either of sending, or notifending of the Merchant, where most commonly the

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proportion of the body of the Factor is in such proportion of the stock which the Merchant byeth in, as the gain of the said Factor is unto the gain of the Merchant. As thus, if a Merchant do deliver into the hands of his Factor so pound, and he to have half the profit, the person of the said Factor shall be esteemed to know he worth 400 pound; and if the Factor do take he of the gain, he should have but; so much sithe gain as the Merchant taketh, which must have a, wherefore the person of the Factor sesteemed but the; of that which the Merchant sayeth in, that is to say, two hundred pound.

And if the Factor did take the 2 of the gain, then the Merchant shall take the residue which mi, wherefore the gain of the Merchants at the Factor is then in such proportion as 3 mto 2: whereupon if you will then know the dimation of the person of the Factor, say, If 3 give 2, what shall 400 give? Work, and so thall sinde 266? pounds. And so much she person of the Factor esteemed to be

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And if the Merchant should deliver unto his infor 400 pound, and the factor would lay 180, and his person, to the end he might we the; of the gain, I demand how much all his person be esteemed?

Anwer. Abate 80 from 400, and there will main 320. And at so much shall his person esteemed.

A Merchant hath delivered unto his Factor 900 pounds to govern in the Trade of Mere chandize, upon condition that he shall have the tof the gain, it any thing be gained, and alfo to bear the fofthe loffe, if any thing be loft. Now I demand how much his person was esteemed at 2 dilla

Answer. Seeing that the Factor taketh the of the gain, his person ought to be esteemed as much as ; of the flock, which the Merchant layeth in : that is to fay, the sof yoo pound, which is 450. The reason is, because of the gain that the Factor taketh is the sof the sof the gain that the Merchant taketh, and so the Factor his person is esteemed to be worth 450 pounds.

A Merchant hath delivered unto his Factor 600 li. and the Factor layeth in 250 li. and his person. Now because he layeth in 250 li. and his person, it is agreed between them, that he shall take the 3 of the gain. I demand for how much his person was esteemed?

Answer. For as much as the Factor taketh of the gain; be taketh ? of that which the Merchant taketh, for are the of & And therefore the Factors laying in aught to be 400 li, which is ? of 600 pound that the Merchant laid in. Then Subtract 250, which the Factor did lay in, from 400 pound which should have been his whole stock, and there remaineth 150 pound for the estimation of his person.

More, a Merchant hath delivered unto hi Factor 800 pound, upon condition that the in is

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Petor shall have the gain of 160 li. as though he laid in fo much ready money : I demand what portion of the gain the faid Factor shall

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Answer. See What part the 160 (which the Factor laid in) is of 960, which is the whole lock of their company, and you shall finde ; And fuch part of the gain shall the Factor take.

But incase, that in making their Covenants, i were fo agreed between them, that the Factors hould have the gain of 160 pound of the whole lock which the Merchant layeth in, that is to in, of the 800 pound: then should the Factor the fof the gains, for 160 is fof 800 pound.

ಂಸ್ಕ್ರೀನ್ ಚಿತ್ರೀನ್ ಕ್ರೀನ್ರ್ ಸ್ಕ್ರೀನ್ ಕ್ರೀನ್ರ್ ಕ್ರ್ರ್ ಕ್ರ್

the thirteenth Chapter intreateth of Rules of Barter, and exchanging Merthandize, which is distinct into seven Rules, with divers other necessary quefions incident thereunto.

The first Rule,

Wo Merchants willing to change hole their Merchandize the one with the other: The one hath 24 broad clothes at 10 li. 10 s. the piece : The other th Mace at 12 shillings the pound. The queis, how many pounds of Mace he ought Mm 3 to

to give for his Cloth, to fave himself hasm-

Answer, Seek first by the Rule of three what the 24 Clothes cost at 10 pound 10 shillings the piece, and you shall finde 252 pound: Then to finde the quantity of Mace, say ugain by the Rule of three, If 12 shillings buy one pound, what shall 252 pound buy me? Work, and you shall sinde 420 pound of Mace: and so many pound ought he to give for his Clothes.

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Two barter. The one hath 420 pounds of Mace at 12 s, the pound, to barter or change broad Clothes, at 10 pounds 10 shillings the piece. The question is, how many broad Clothes he ought to give for all his Mace?

Answer. First say, If one cost 12 shillings, what 420? you shall finde 3040 s. Then say again, If 10 pounds give one Cloth, what shall some 5040 shillings give? Work, and you shall sinde 24 Clothes, your desire.

The fecond Rule.

Two change merchandize for merchandize:
The one hath Pepper at two shillings for pence the pound to sell for ready money. But in barter he will have no lesse then that shillings the pound. And the other hath Hallings the pound.

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Indet five shillings fix pence the Ell ready money. The question is now, at what price he ought to deliver the Ell in the barter to fave binfelf harmleffe.

Answer. Say by the Rule of three direct, If 1-ready money give 3 s. in barter, what shall sigive in barter? You shall finde 7 125. and at has price ought the second Merchant to fell his Hotland in barter.

The Proof.

Two barter. The one hath Holland at five s. spence the Ell to fell for ready money. And abarter he will have 7 17 s. The other hath hpper at 2 s, 4 d, the pound, to fell for ready money. The question is now, how he ought to Min barter?

Answer. Say by the Rule of three direct, If Gready money give 7 12 s.in barter, what ought 1 to take in barter? Multiply and divide, and m hall finde 3 shillings your desire.

The third Rule,

Two barter. The one hath cloth of Arras at as the Ell ready money, but in barter he will in live 35 is. And the other harts white Wines mich he delivered in barter for 16 pounds of the Tun in ready money.

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Answer, Say by the Rule of three direct, if 35 \$s. in barter, give but 30 s. ready money, what did 16 pound in barter coft ? Work, and you shall finde 13 li. 10 s. Fr And fo much coff his Wines for a Tun ready money.

The Proofe.

Two barter Merchandize for Merchandize: The one hath white Wines at 13 li. 10 s. 41 the Tun to fell for ready money: But in barrer he delivered it for 16 pounds. The other, to make his match good and fave himself harmleffe, delivereth Arras at 35 s. the Ell. The queltion is now, what an Ell of his Arras coll in ready money?

Answer. Say by the Rule of three direct : If 16 pounds in harter give but 13 li. 10 3; s. in ready money, what shall 35 : 5. yeeld in burter! Work, and you shall finde 305, your defire.

The fourth Rule.

Two barter: The one hath Kerfeys at 14 pounds the piece ready money: But in barter he will have 18 pounds: and yet he will have the part of his over-price in ready money. And the other hath Ginger at eight groats the pound to ad fell for ready money. The question is, bon be les ought to deliver the Ginger by the pound in bar 1002 ter to save himself harmlesse, and make the bar her ter equal.

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Answer. Item, for the working of this quefor, and fuch other the like, you must underand, if the party over-felling his wares, remire to have also some portion in ready momy, as 1 3 3, &c. Then shall you first rebate he same demanded part, whatsoever it be, from the over-price, and also from the justrice. And those two numbers that shall resin after the fubtraction is made, shall be the no first numbers in the Rule of three. And the A price of the same Merchandize shall be the hird number, which by the operation of the ale of three direct, shall yeeld you a true fotion, how, and at what price you shall over-Althat your Merchandize, to fave your felf umlesse, and make the barter equall,

Example.

Take the { (of eighteen) which is the overthick you must subtract from

14 18, there rest 12. And also 14-18

he bate it from 14, which is the the price of the Cloth, and the tere remaineth 8, which 8 to ad 12 are the two first num-

be ers in the Rule of three. Then take eight her fay by the Rule of three direct. If eight ounds give 12 pounds, what shall 2 ; s, give? b.bets MulMultiply and divide, and you shall finded s. And for so much shall the second Merchant sell his Ginger, or his commodity in barter, to ballance the same equals.

The Proofe.

pounds the piece ready money: But in barrer he will have 18 pounds: and yet he will have the part of his over-price in ready money. And the ether hath Ginger, which he having cunning enough to make the barter equall, delivered in barter for 45, the li. The question is now, what his Ginger cost him ready money?

Answer. After you have made the subtraction, abating 6 the part of 18, both from 18 and 14 (as before was taught you:) then will there remain 8 and 12 for your two first numbers in the Rule of three. Then say, If 12 give 8, what shall come of 4 the over-price of the pound of Ginger? Multiply and divide, and you shall finde 2 s. 8 d. your desire.

Two Merchants barter merchandize for more chandize. The one hath Devonshire Whites at hi. 13 s. 4 d. the piece ready money: but in barts he doth them away for 8 li. 3 s. 4 d. and yet he will have the part of his price in ready money. And the other hath Cottens at three pounds in the piece ready money. The question is now, at this was price he ought to sell or exchange his Cottens in a

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Anfmen. First feek the part of 8 li, 3 s. ed. which is, 2 li. 14 s, 5 d. which rebated from 8 ligs s. 4 d. there refteth as appeareth w the example abovefaid, 5 li. 8 s. 10 3 d. which is ? parts of 8 li. 3 s. 4 d. also rebated from 7 li. 13 s. 4d. there refteth 4 li. 18 s. to d. the two first numbers in the Rule of hree, and the three pounds, which is the neat pice of the piece of Corten, is the third numer: Then fay by the Rule of three direct, as was taught before, If 4 li. 18 s. 10 1 d. give sli. 8 s. 102 d. what shall 3 pounds give? Miltiply and divide, and you shall finde three rounds 6 s. 33 d. the just price that he ought odeliver his Cottens in barter.

The fifth Rule.

to Ino Merchants will change Merchandize for deschandize. The one hath Kerseys at 43 s.the desire are to sell them for ready money. And in bar-me to be will sell them for 56 s. 8 d. and he will make in after ten pounds upon the 100 pounds. And yet

money. The other hath flax at 3 d. the pound ready money. The question is now, how he shall sell

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ay,

the pound of his flax in barter?

Answer. See first at 10 pound upon the 100 pounds what the 56 3 s. commeth to, in saying, (by the Rule of three direct) If 100 pounds give 110 pounds, what 56 3 s? Multiply and divide, and you shall finde 3 pound 2 shillings 4 pence, of which the 1 that he demandeth in ready money, is 1 pound 11 shillings 2 pence; the same 31 s. 2d. abated from 40 s. and also from 56 s. 8 d. there will remain 8 s. 10 d, and 25 s. 6 d. for the two first numbers in the Rule of Three, and 3 pence the price of the pound of flax for the third number. Then multiply and divide, and you shall finde 8 3 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d. And for so much shall finde 8 4 3 d.

The fixth Rule.

Two are Willing to exchange Merchandra: The one hath Norwich Grograns at 25 s, the piece ready money: and in barter he will have 30 s. and he will have the part of his over-price is ready money. The other hath Norwich Stockings at 40 s. the dozen to sell for ready money. But in as much as the first Merchants Grogranes are in better, he would deliver them so to ballance the barter that he may gain 10 pounds in the 100 pounds. The question is now, how he shall sell

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W Hofe the dozen in barter, according to his re-

Answer. Say, If 100 give 110 li. what shall 40 s. give, which is the just price of the dozen of stockings? Multiply and divide, and you hall finde 44 s. Then take the coff 30 s. which 17 s. 6 d. and subtract it from 25 s. and also som 30 s. and there will remain 17 s. 6 d. md 22 s. 6 d. for the two first numbers in the Rule of three, and 44 shillings, which is desjust price (with his gain in the dozen of stockings, for the third number. Then multiply and divide, and you shall sinde 56 s. 6 c. d. md for so much he is to sell his dozen of stockings in baster.

moolis bas The feventh Rule.

Two Merchants will change their Merchanlize one with the other: The one hath 720 Ells of Cambrick at 5 s, the Ell to fell for ready mony, the barter he requireth 6 s. 8 d. And yet notwithflanding he loseth by it after 10 pounds upon the 100 pounds, whereupon he requireth one half white overprice in ready money: and the other Merchant having skill enough to make the barter quall, delivered English Saffrons at 30 s. the pund. The question is now, what his Saffrons cost

Answer. You must first seek what is lost pon the 100 pound, which to doe, you may by, (if you please) If 100 pound lose 10, what shall

thall 6; lofe? Work, and you thall finders (or 8 d.) which must be rebated from 6 s.84 fo resteth 6 s. still. Or you may fay, If 100 pound give me bur 90 pounds, what shall 68 8 d. give? Work this way either, and won thall finde allo as before directly in your one tient 6 s. your delire. Then are you next tocal up what the 720 Ells of Cambrick commen to at 6 s. 8 d. the Ell, and you fhall finderan pounds : the whereof the Cambrick Merchant will have in ready money (which is 120 pounds:) Nextly you must cast what the Cambrick commeth to after his loffe in the 100 pound, which as you found, is but 6s an Ell, and you shall finde 216 pounds: Now must you subtract his ready money (which is 120 pounds in all) out of 24 o pound, and also out of 216 pound, and there will remain 120 pounds, and ob pounds for your two first sumbers in the Rule of three, and to failling is the over-price of pour Saffron for the third number: Then multiply and divide, and you shall finde 24 shillings. And for much did his Saffrons collin ready money

Two Merchants barrengthe one hath 50 clubes to put away for ready money at 11 pounds the cloth, and in barren partiesh them away for to pounds, taking Holland cloth at 10 d. the Flummish Ell, which was worth no more but 18 d. The question is now, what Holland payeth for the Cloth, and what he winners or loseth by the begain?

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Answer. Fifty Clothes at 11 pounds the cloth commeth to 550 pounds, and put away 12 pounds the piece, maketh 600 pound. Then to finde what Holland payeth for the cloth, say by the Rule of three direct. If 20 d. my one Ell, what 600 pounds? Work, and 10 thall finde 7200 Ells. Now to finde the cate of his gain or losse, you must seek what 17200 Els commeth to at 18 d. the Ell: Work the Rule of proportion direct, and you shall the 540 pounds, which is not so much as his lothes were worth in ready money by ren winds: and so much lost the first Merchant this Exchange.

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Nenetian bath in London 100 pieces of to put away for ready mony at 3 ll. the piece. In in Barter he delivered them for 41 the piece, bing Wools of a Felmonger at 7 li. 10 s. the C. might, which was worth no more but fix pounds in C. ready money. The question is now, what make payeth for the filks, and which of them

inneth or lofeth by the barter ?

Answer. A hundred pieces of Silk at 3 living all 300 living and at 4 living 400 living and at 4 living 400 living and at 4 living 400 living and for the Silk, say by a Rule of three direct: If 7 to buy me 100 night, what 400 pound? Work, and find 53 to weight of wooll. Now to finde the estate of their gain, and losse, cast up his Woolf their gain, and you shall finde 320 pound, hith is 20 pound more then the silks were

tobe fold for ready money, whereby the Vene. tian gained 20 pounds by the Barter.

A Merchant hath 53 ; weight of Wooll at 6 pounds the C, to fell for ready money, but in bar ter be will have 7 pounds 10 5. and another doth barter with him for Silks, which are Worth three pounds a piece ready money. The question is now. how he ought to deliver his Silks the piece in barter, and how many payeth for the wools

Answer Say by the Rule of proportion for by the Rule of three direct) if 6 pounds for C. weight ready money, yeeld me 7 li. to s. what will a li-veeld which is the just price of a piece of Silk in Barter, to make the Truck equal ? Work, and find 3 li. 15 s, the price of a piece of Silk in Barter: then fay, If 3 li. 15 stequire one piece of Silk, how many pieces of Silkare bought with 400 pound, which is the value of 53 C. weight of Wooll, at 7 li. 10 s? Work by the Rule of three direct, and you shall finde 160 pieces of Silk and 3 of a piece, and fomny of Silk pay for the wooll, and neither party bath advantage of other

Two men will change Merchandise the one with the other. The one of them hath Beer at 6s. & de the Barrell, to fell for ready money, but in Barter he will fall the Barrell for 8 st and you the he will gain moreover after. 10 pounds upon the Wooll at 2 s.the Rove to fell for ready money. The question is now, how he shall deliver the Row It's wooll in Barter to save himself barmlesse. aper

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In Anlwer. Say, if 63 s. which is the just price of the barrell of beer, be fold in barter for 8 hillings : for how much shall so shillings (which is the just price of the Rove of Wooll) befold in barter? Work by the Rule of three firet, and you shall finde 24 s. Then for becole the first Merchant will gain after 10 ounds upon the 100 pounds, he maketh his pounds, 110 pounds. And therefore fay the Rule of three, If the second Merchant 110 pounds do make but 100 pounds, how the shall he make of 24 s? Multiply and dide and you shall find 21 s. 9 d. if of a penys for fo much shall he fell the Rove of wool be delivered in barter, to the end the first ferchant may give 10 in the 100.

Two Merchants Will change their Commodiwhe one with the other. The one of them bath the paper at 4. s. the Ream, to fell for ready And in barter he will doe it away for 5 st get he will gain moreover after the rate of 10 ds upon the 100 pounds. And the other hath Mes at \$4 s. 6 d. the pound weight to fell in where Nom I demund what the pound did coft

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Answer. Say if 5 s. (which is the over price the Paper in barter) become of 4 s, the just ice of how much shall come 14 ! shillings, hich is the furprize of the pound of Mace in The mer? Multiply and divide, and you shall find oper will gain after 10 upon the 100, Say, if Nn TOO

Work, and you shall finde 12 s. 9 13 d. and 6 much did the pound of Mace cost in realy mony.

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The fourteenth Chapter intreaters of exchanging of mony from one place to the other.

Xchange is no other thing, that to take or redeive money in one City, to render or pay the value thing in another City, or elfecto given ney in one place, and receive the

walne thereof in another, as term of certain days, months, or fairs, according to the diversity of the place.

But this practice chiefly consisteth in the hum. ledge of the money or Coyns in divers places, of which for thy benefit (after a few examples ginth to the introduction of this work) I will set dual certain notes of the diversity of the common usuall coynes in most places in Christendousse traffick.

And first I will begin at Antwerp, where they use to make their accounts by Deniers is grosse, that is to say, pence Flemmish, where is do make I s. Flemmish, and so s. doe make

one pound de groffe.

Icem .

Item, a Merchant delivered at Antwerp, to pounds Flemmily to receive in London 20 feeling, for every 23 s.—4 d. Flemmish: The question is now, bow much sterling money is the received at London for 400 pounds Flem-

Infiner. Say by the Rule of three, If 23; homeis give 20 s. sterling, what 400 pounds would be will finde 342 to pence, and so much sterling shall receive in London for the said 400 pounds would be said 400 pounds

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Otherwise also wrought by Rules of practice taking the - of the Flemmish mony delived, and abating the same from the principall, areli is English mony, as before.

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11 342 --- 17 --- 13 fterling.

dent of Merchant at London delivered 200 li. lond oling for Antwerp, at 23 5—5 d. Flemmish and spounds sterling: the question is, how much he after af receive at Antwerp.

Answer, Say by the Rule of three, if I pound there sling give 25 s. 5 d. Flemmis, what 200 li. with sling? Work, and thou shalt find 234 limited and So many pounds Flemmis shall he make seive at Answerp for the said 200 pounds thing.

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Hemmille give 20 s, lacting, what 400 pound

Exchange for Antwerp, at 23 s. 9 d. Flemmit the pound sterling: the question is, at wherein the Flemmish mony ought to be returned to 4 pounds upon the 100 pound sterling at Loudon

Answer. First, say by the Rule of three the rect: If I pound sterling give 23 \(\frac{1}{2}\) Flemming what 200 pounds sterling? Multiply and divide, and you shall find 237 pounds so shill lings. The which to return to gain 8 pound sterling in London, say by the backer Rule, I 200 pounds sterling require the exchange 23 so d. Flemmish, what the exchange to make 20 li. sterling? Work by the Rule, and sinde 22 to d. Flemmish, the effect in the question in quired.

Flemmish, to pay for the same at London, a soilings sterling, and when the day of payment come, I am forced to return the same mony again London, to pay my Bill of Exchange: so the for 20 shillings which I take up here at London I must pay 19 s. 6d. at Antwerp, I demand when

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Let I do win or loft, and how much in or upon the po pounds of mony?

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Manfwer. Say by the Rule of three : If 19: we 19 ; what will 1 40 pounds give ? Multiand divide, and you shall find 99 li, 2 119 which being abated from 100 pounds, there which being abated from 100 pounds, there
differmain 17 shillings ", and so much I do
fe upon the 100 pounds of mony. apon th

If I take up at London 20 Shillings sterling on up mony again at Antwerp, wherewith apment is come, my Factor is constrained to up mony again at Antwerp, wherewith ing the aforefaid sum, and there he doth re-305. at London: The question is now, wheo'I doe win or lofe, and how much upon the too li. of mony after that rate.

dufwer. Say by the Rule of Proportion, If 35 14. give 23 ; s. what will 100 pounds give? and fairly and divide, and you shall find 104 as souds 9 shillings 27, from the which abate hillings 37, and fo much is there gained upthe 100 pounds of mony.

12 In Antwerp is delivered 200 pounds Flemwith by exchange for London, at 20 shillings wing for every 23 shillings 4d. Flemmish the question is, at what rate the same is to be do durned to gain 10 pounds upon the 100 pounds kmmish in Antwerp.

An-

Answer. First, say by the Rule of three is 23; Flemmish give 20 s, what shall 200 points gain? Work, and you shall finde 171 points 8 s. 6; d. Then say again by the Rule of the direct, if 171 pounds 8 s. 6; s. sterling, and me 210 pounds Flemmish, what shall 20 ther ling give? Work, and you shall find 24 s. 6d Flemmish. And at the same rate ought the same to be returned at Answerp, to gain 10 pounds upon the 100 Flemmish.

pound 3 s. 4 d. Flemmish, to receive at London 200 pounds sterling: The question is now, in

the exchange youth after this rate?

Answer. San by the Rule of three died if 200 give 20, what 234; ? Multiply and divide, and you shall find 23 5 5 d. And for much goeth the exchange.

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Item, the exchange from London into France, is not like as it is a Flanders, but it is determined the French Crown, which is worth 50 South

Turnois the piece.

Whereupon also you must note, that in they make their accounts by Franks, Souland Deniers Turnois, whereof 12 Deniers min one Soula Turnois, and 20 Soula makethous pound Turnois, which they call a Line of Frank. But the Merchanes, to make their counts, doe use French Crowns, which is no rant among them for 51 Soula Turnois But exchange it is otherwise, for it is delivered for 50 Soula Turnois the Crown, or as the use

of the many can agree with the deliverer. and note that this & Character representeth the Crown by exchange, and is ever 50 Soulk Tamois or French mony.

Merchant delivereth at London 340 minds sterling, after 5 shillings six pence the crown, to receive at Paris 50 Soula Turnois Gevery Crown. I demand how much Turnois French mony payeth the Bills for the faid 240

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Answer. Say by the Rule of three, If 5 is. ferling give me 50 s. Turnois, what shall 240 pounds sterling give ? Reduce the pounds into hillings, then multiply and divide, and you hall find 2181 Liures, 16 Julx, 4 Deniers, und & Turnois: and fo much payeth the Bils at Paris, for the 240 pound fterling.

A Merchant delivereth at Roan, or elsewhere France, 1430 pounds or Franks, the which Frank or pound is 20 Soulx, or a pound Turnois, wreceive in London 6 s. 4 d. fterling for every A of 50 Soulx Turnois. The question is, how mich ferling mony I ought to receive at London

for my 1430 pound Turnois.

Answer, Say, if 2 } pounds give me 6 ; s. what will 1430 give me? Work, and you shall find 3622 thillings sterling, which maketh 181 bounds 2 s. 8 d. and fo much mony is to be rereived at London, for the faid 1430 Liure Turnois, after 6 s. 4 d. for every a of 5 o Soulx.

In London is delivered 200 pound sterling by exchange for Paris, at 5 s. 9 d.the & of 50 Soulx

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Turnois. The question is, at what price the fail A is to be returned to gain 6 pounds upon the 100

pounds ferling at London.

Answer. First, say (by the Rule of three direct) if 5 \frac{1}{2} s. Sterling give 50 Soulx Turnois; what shall 200 pound sterling give 7 Work, and you shall find 1739 Franks or Liures, 2 \frac{1}{15} Soulx. Then the which to return and gain 6 pounds upon the hundred pounds in London, say by the Rule of three direct, if 1739 Franks 2 \frac{1}{15} Soulx yeeld 2 12 pound, what the \(\Delta \) of 50 Soulx ? work and find \(\Delta \) s. I \(\frac{1}{15} \) d. the effect tequired in the question.

A Merchant delivered in London 160 pounds sterling, to receive in Biskay for every 5 \$1.6 d. one Ducat of 374 Carvides. The question is how many Marvides ought I to receive at Biskay?

Answer. Say, if 5 is s. sterling give 374 Marvides: what shall 160 pounds sterling give?

Multiply and divide, and you shall find 217600

Marvides, and so many I ought to receive at

Biskay for my 160 pounds sterling.

A Merchant delivered in Baion, 4000 Mavides, to receive in London 5 s. 8 d. sterlings every Ducat of 374 Marvides. The question is now, how much sterling mony payeth the Bill of Exchange for the said 4000 Marvides?

Auswer. Say, if 374 Marvides make one Ducat, what 4000 Marvides? Multiply and divide, and find 106 172

Then say again, if I Ducat give 5 \$ s. what give to 106;25 Ducats? Work, and find 30 1.65,11

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Otherwise it is wrought more brief at one working, as in the last question before, in confidering that 5 s. 8 d. containeth one Ducar, or 274 Marvides. Therefore fay by the Rule of 3, 1474 Marvides give 5 s. what 4000 Marvides? Work, and you hall also finde in your morient 30 14 s. And fo many pounds fterling sto be received for the 40000 Marvides.

In London 200 pounds delivered by exchange for Vigo, 374 Marvides the Ducat of 5 s. 10 d. ferling, maketh 256457 - Marvides: the which to return and gain 10 li, upon the 100 pounds in London, say by the Rule of three direct, if 220 Meregaire 256457 + Marvides, what 5 5: 10 d? Work and find 3 40 Marvides, the price of even Ducat in return, Which is the effect in the question required.

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t gi-Smith herThese may seem sufficient for instructions.

TOtwithstanding for thy further aid and benefit, hereafter follow fix special and most rief Rules of practice, for English, French, and Flemmish mony.

How to turn Flem. to English sterling. How to turn English sterling to Flem. How to turn Flemmish to French. How to turn French into Flemmish. How to turnsterling into French. How to turn French into lierling.

The fifteenth Chapter intreateth of the faid fix Rules of brevity, and of valuation of English, Flemmish, and Frenth mony, and how each of them may eafily be brought to others value.

How briefly to reduce pounds, shillings, and pence Flemmish into pounds , Shillings , and pence English sterling

Rufe I.



T is to be noted, that 7 pounds Flemmish maketh but 6 pounds fterling : 7 s. Flemmifb maketh6 s. fterling, and 7 d. Flemmif 61. Rerling : fo that 7 yeeldeth box 6. Wherein is evident that then

is tolt;, (if it may be so called) when it is reduced into English mony : wherefore to know how much 233 1-13 5-4 d. Flemmif miketh Englift, you must fabrract from it; , beginning with the pounds, &c. and that which refteth after this fubtraction , is the fun required : fo that 233 li .- 13 s .- 4 d. Flammill. maketh 200 li. 5 s. 8 3 d. fterling.

Example.	Another Example.
233—13—4	1i. s. d.
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do 200 + b Suoq 8 fter	266 am 11 5 \$

To reduce pounds, shillings, and pence sterling, into pounds, shillings, and pence Flemmish.

Note that a pound sterling maketh 1 li. 3 s.

4 d. Flemmis. that is, 1; li.1 s. sterling maketh

1 is. Flemmis. and 1 d. sterling maketh 1; d.

Flemmis. So that there is gained (if it may be

fo called); of the summe being thus reduced

to Flemmis. for of ; is made; which is

one whole, and; Then to know how much

137 li. 7 s. 6 d. sterling maketh Flemmis, sub
tract from your sterling, the; of the whole

summe, and adde it to the same summe, and it

maketh 276 li. 18 s. 4 d. which is the summe

required.

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- Example.	Another Example.		
li, El s. d.	1i. s. e. d.		
237-7-6fter.	337		
\$ 39 - II-3	25634		
276—18—9 Flem,	393-3-		

Rule 3.

To reduce pounds, shillings, and pence Flemmish, into pounds, shillings, and pence French.

Ye shall note, that the equality of Flemmish and French mony is this, that is to say, the pound Flemmish, maketh 7 pound; French, or Turnois. 1 s. Flemmish maketh 7; s. French, and a groat Flemmish, maketh 7; d. French.

Wherefore to know how much 143 li. 48, 9 d. Flemmish maketh French, ye must mustiply the whole number twice by 6; beginning at pence, and so forward, and the product of your second multiplication divide by 5, so the work is finished. Or multiply the said summe by 7, and take out of it i, adding it to the product of your multiplication by 7, and that is your number required. So that as well by the one as by the other, 143 li-4s-9d. Flemmish, maketh 103 1 li-6 s-2 fd, French or Turnos.

Example.	ng e ann	The fa	me otherwise
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	6	3 28_	12-11
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Another Example. Or thus:
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leveng, into younds, things, and pence,
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1029 fl. ; or 12 s. French.
Wherefore to know what agrin is s. 4d.
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To reduce pounds, shillings, and pence, Rule 4.
Brench, into pounds, Shillings, and pence,
Flemmisharing required from the required immer to
Otherwile, mulfiply the famme fterling by &
Moltiply 233 li-8 8-4d, French by 5,
and divide the Product twice by 6, that is, the
hid number by 6, and the product or quotient
again by 6, and the quotient of this fecond
Division is the thing required. So that 233 li-
84-4d. French, maketh 32 li-8 s-42 d.Flem-
mith.
b Example. Another Example.
+ H. 1 - 1 2 d. + H. s. d.
3 233-8-4 Fren. 758 French.
And the same of th
1167-1-8 3765-
\$ 194-10-3
(Care to a Care to the Care to a Care to the Care to
- 32-8-4; Flem, -104-11-8 Flem.

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Rule 5.

To reduce pounds, stillings, and pence, sterling, into pounds, shillings, and pence, French, or Turnois.

The pound sterling maketh 8 li. 8 s. French, that is to say, 8 \(\frac{2}{3} \) pounds: the shillings, maketh 8 \(\frac{2}{3} \) shillings, and the peny 8 \(\frac{2}{3} \) d. French, Wherefore to know what 231 li. 13 s. 4d. sterling maketh French, ye must multiply your whole summe by 42, that is, by 7, and the product of it by 6, and divide this second product by 5, and that is the summe required.

Otherwise, multiply the summe sterling by S, and adde twice to the product \$5, and it shall produce the sum required. So that both wayes 23 I light 5 Ad. sterling, maketh 1946 point

French, as here under followeth.

Sterling.

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French.	. 6	-84 Fr	4 5 5 5 A
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Note, that when any mony is given by exchange at London for Roan at 71 d, or rather 71 for the Crown of 50 s. French, there is neither gain nor losse: for it is one mony for another, accounting 8 li. 8 s. French, for one pound sterling. So the giver loseth the time of payment, which is about 15 days, and he that taketh it, hath the gain of the same.

They of Roam, that put forth or take money by exchange for London, ought to have like

consideration.

pence; or rather 64 and have at one of the Fairs of Lions a Crown de Marc, he that to give the the mony, loseth the time, and he that taketh ir, gaineth the same: for 62 pence, is equall in value to 45 s. French. He that pinned or taketh mony at Lions for London, ought to consider the same.

to receive at Linns a Crown de Marc, bethat putteth it forth, loseth the time, and he that taketh it gaineth the same. For 75 groats Flemmish, is equall in value to 45 s. French.

Thus for this time I make an end of the practice of Exchange, and the instructions thereunto belonging, and according to my promise: yet further to gratify such as are desirous to know the common Coyns used for traffick among Merchants in these Cities following, a brief declaration of their Monies, and the reckonings, and account of them.

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charation of the valuation and diversity of Coyns of most places of Christendome for Trassick; And the manner of Exchange in those places from one City or Town to another: which known, is right necessary for Merchants, by means whereof they do finde the gain or losse upon the Exchange.

Tem, for as much as the greatest diversity of mony of Exchange is at Lions; therefore I will begin duly of the money of that

place.

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The

At Lions they use Franks, who, and Deniers Turnois. A Frank maketh Soulx, and one Soulx 12 Deniers; but the lichants to keep their Books of Accounts, one French crowns of the Mark at 45 Soulx to piece, and do divide it into 20 Soulx, one only is 12 Deniers.

Item, a Mark of Gold maketh 65 \triangle of the \triangle This lift, which serveth for exchange, and divide mark stantinto 8 ounces, the ounce into 24 pence or deth for a thiers, the denier into 24 grains, and so the Crown.

Alfo at Lions there are four Fairs in a year, the which they do commonly Exchange, hich are from 3 moneths to 3 moneths.

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At Geans they use the Soulx: one Ducat ma

keth 3 pound.

At Naples they nie Ducats, Taries, and Grains : the Ducat maketh five Taries, and one Tary 20 Grains : but they take 6 Ducats which maketh 20 Taries, for the ounce.

A Ducat maketh ten Carlins, and a Carlin ten grains, fo that 2 carlins make a tary, and

100 grains make a ducat.

At Rome they use the Ducars of the Chamber : one Ducat is worth 12 Guillis, and one Guillis ten Soulx.

At Venice they use Ducats current at 114 Soulx a piece, or 24 Deniers, and one denier

maketh 32 Picolis.

At Palerme and Messing they write, ther ounce, tary, and grains, and one ounce is worth 6 ducats of 30 taries, and I tary is 20 grains, and I grain 6 picolis, I ducat is also worth 24 carlins.

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At Millan they use list. d. of Ducat Impe-

rials, and a of exchange is worth 4 li.

At Lucques, Florence, and Ancone, they wie the a of Gold: in Gold the French Crown is worth 7 li. but at Boloigne 3 li. 10 s.

At Barcelone they use the Soulx: the Duck

of Exchange is worth 22 Soulx.

At Valence and Saragoffe they use the Liver Soulx, and Denier: the French Crown ofer Soulx, and Denier: the French Crown of the ochange is worth 20 Soulx, and one Soulx is I callide Deniers.

At the Fairs of Castile they use the Mu veide wides, the Ducat is worth 375 Marveides.

At Lubone they use the Rayes, one Ducat of

Exchange is worth 400 Rayes.

At Novemburg, Frankeford, and August in Germany, they use the Krentzars, whereof 60 mike a Floren.

At Antwerp they use li. s. d. de Gros, and they exchange into the Denier de Gros, to wir, but English peny.

At London they use the li, the s, and d. ster-

hig, and they exchange in pence sterling.

The Exchange of Lions at Sundry places.

hem, at Lions there is exchange in three hors, at the Cities and Towns following.
First, they deliver at Lions one Mark to have inteceive at Naples almost 41. Ducats, at Venice 70 ducats currant, at Rome 63 ducats of the Chamber, at Lucques and Florence 65 Δ of Gold, at Millan 82 Δ .

And contrariwife, at the faid Cities afore-

bork at Lions.

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Secondly, they give at Lubone one & of lark of 45 Soulx Turnois a piece, to have at leans almost 68 Soulx, at Palerme and Messine livet most 24 Carlins, at Barcelone 22 Soulx, at Valence or Saragosse 20 Soulx, at the Faire at lastile 350 Marveides, at Lubone 360 Rayes, Antwerpe 57 Deniers de Gros, and at Long, veide O 0 2 And

And contrariwise, they give in the said Cities almost as much of their money to have a French Crown of the Mark at Lions.

Thirdly, they do give at Lions a A of the Sun, to have almost 93 Krentzars at Frankeford, Augsburg, Novemberge, or other Cities in Almaine.

Also at Lions only they do pay, they change the in Gold, and in mony, or else all in mony, in giving 1 is for the hundreth.

Changes at Naples and other Towns.

Item, at Naples they give or deliver almost 112 Ducats, to receive at Rome 100 Ducats of the Chamber at the old value.

Through Lucques and Florence they deliver 100 Ducats Carlins, to receive there almost 86 A of Gold.

Through Palerm and Messine, one Ducatof 5 Tary, to receive there almost 164 grains.

Through Millain, one Ducat to receive there

almost 90 Soulx.

Through Geans, one Ducat to receive there almost 65 Souls. The whole summe to be paid within ten days after the sight of the Bill of Exchange.

Also at Naples, they deliver one Ducat toreceive in Answerp almost 67 d. or Deniers de Gros, within two moneths. At London almost 60 d. sterling in three moneths. At Barfelunt almost 20 Soulx within two moneths.

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At Valence, almost 18 Soulx within two Moneths. At Libone 333 Rayes within three Moneths & And at the Fair at Caffile almost 940 Marvides, at the fame Pair.

Change of Venice to other places.

At Penice they deliver 100 Ducats current ig receive in Almain almost 140 Florens at 60 Krentzers the piece.

At Lucques and Florence almost 108 A of

Gold in ten days.

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Nio)

Likewise at Venice they deliver a Ducat currant to receive at Palerm and Messine almost at Carlins: at Millan almost 93 Soulx : at Geanes almost 62 Soulx, the whole at ten dayes end.

Of the Pair or Pari.

As touching the Exchange, it is necessary to understand or know the Pair, which the Italians call Pari, which is no other thing then to make the money of the change of one City or Town, to or with the money of another, by means whereof they do finde the gains or loffe upon the Exchange.

shround one Example. Item, having received Letters of credit of one of Antwerp, that the & of the Sun is there worth 7 Souls: The question is, what the same 19 Worth at London, when the Pair of Exchange goeth for 23 shillings?

Answer. Say, if 23 give but 20, what giveth 73 Worke, and finde 81. 1, id. and fo much is

the A of the Sun Worth at London.

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The

The seventeenth Chapter containeth also a Declaration of the diversity of the Weights and Measures of most places of Christendome for traffique. At the end of which Discourse are two Tables, the one for weight, and the other for measure, proportionate and reduced to an equality of our English measure and weight, by the aid whereof, the ingenious may easily by the Rules three, convert the one into the other at pleasure, &c.

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T London, and fo all England the row, are used two kindes of Weights and Measures, as the Troy weight, and the Haberd-poise. From the Troy weight is derived the proportion and quantity of all kinde of dry and siquid Measures, as Pecks, Bushels, Quarters, &c. wherewith is bought and sold all kind of grain and other Commodities mete by the Bushell. And in siquid, Ale, Beere, Wine, Oile, Butter, Honey, &c. Upon these grounds and Statutes is bread made, and sold

fold by the Troy weight : and fo is gold, filver, bearl precious flones, and Jewels. The leaft conneley of this Trop weight is a grain : 24 of hele grains make a peny-weight, ewenty peny reights an bunee, and 12 ounces a pound, two counds of pints of this weight makethis quart. and for afeending into bigger quantities, is duced the Measures whereby are fold our other naturall fustenance : viz. Ale or Beere, with all other necessary commodities, as Butter, Hony, Herings, Eeles, Sope, &c. All which See further last before rehearsed, though their Measures of these (wherein they are contained) be framed and Weights enved from the Troy weight, yet are they in raffique with divers Commodities, as Lead, Reduction, Time, Flax, Wax, with all other commodi- beginning, der both of this Realm, and of other for- pag. 133. Countries whatfoever, bought and fold by the Haberdepoife weight after fixteen ounesto the pound, and 112 pound to the C. weight. And to every C. is allowed but 12 pound weight at the Common-beam. From hence is also derived the weight of Suffer Cheefe, which containeth 32 Cloves, 8 pound to a Clove, and weigheth in all 256 pounds. And also the Barrell of Suffolk Butter is, or fould be of like weight with the weight of Cheefe, viz. 256 pounds. More 14 of thefe pounds make a Stone, and 26 Stone containeth a Sack of English Wooll: Forraine Wools, to wit, French, Spanish, and Estrich, is also fold by the pound, or C. weight, but most 004 com-

and Mea-

commonly by the Rove, 25 pound to a Rove: other commodities of Tale, are bought and fold by the C. fivefcore to the C. Except headed ware, to wit Gattell, Nails, and Fifth, which are fold after fixfcore to the G. There are also two other forts of Measures, to wit, the Ell and the Yard. By the Ell is usually mer, Linner cloth, as Canvas, &c. And by the yard, Silks, woollen clothes, &c.

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At Antwerp are also two sorts of weights, their gold and silver weight, and their common weight. Gold and silver is weighed by the Mark, the Mark is 8 ounces, the ounce to Esterlings, and the Esterling 32, as our grains. The Goldsmiths divide that into smaller, but not the Merchants. The proof of Gold is made by Karects, whereof 24 maketh a Mark of soc Gold, the Karect is 24 grains; the proof of the money is made by Deniers: 12 Deniers is ones, sine, that is, a Mark of sine silver; the Denier also is divided into 24 grains, and the grain in to four quarters.

Item, 100 Marks in Antwerp, Troy weight, maketh at Lions 103 Marks, 2; ounces, and 20 grains, 23 p. At Noremberg 103 Marks; ounces, 2 Quints, 3 Deniers; at Frankford 105 Marks: at Ausburg 104 Marks, 3 ounces, 1 Quint: at Venice 103 Marks, 1 ounce, 7 Deniers, 18 grains: at London 66 pounds.

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The Mark of gold or filver at Antwerp, Troy weight, which is 8 ounces, maketh 7 & ounces common weight, with which all other Merchandile is meighed Sothat the Troy meight is greater then the common weight by 6 ; in the C. By this weight of Troy, they also weigh Musk, Amber, Pearle &c. . . Mundes - 28 Alas

Allfilks are brought at Antwerp, by the Burges Ell, which is greater then the common mean live by which they retaile by two in the hundred. Their common Ellist of our yard, and of our EU.

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At Lions is used 3 forts of weight, whereof the first is the common Town weight, with which the weigh all kinde of Spicery and idivers other Merchandize. The second is called Geneva weight, which is 8 in the C. greater then the common weight, with which they weigh Silks, &c. The third is French weight, alled commonly the Mark meight, and noo pounds thereof maketh 106; h. Genevan, and 144 of their common weight; with which French weight, is weighed all things that paid custome or toll. Kerhar Lendon ing .

At Lions is also used two forts of Elle or Aulnes. The one wherewith they measure groffe clothes, as canvaffe, and fuch like. The other is called the French Ell or Aulne, with which they measure all other kinde of Merchandize, whereof seven common Town Ells

maketh 11 ordinary French Ells.

Roan

Roan.

At Roan; 6; Muides of Salt, being the meafure of the place, make a C. at Armviden in Zeland, and the C. of Bronage measure of Armviden, maketh at Roan II Muides, 30 Muides make a last of Corn, and 16 a last of Oats, 100 pound weight there, maketh at London 1145, and 190; at Antwerp. And 200 Ells make at London, 115;

Noremburge.

A 100 pound weight at Novemburge maketh at London 1112; at Antwerpe 107; and 100 Ells at Novemburge make at London 75; at Antwerp 95; 8cc.

Lisbone.

The C. weight at Lisbone maketh 4 Roves, every Rove 32 pounds, so that their C. weight is 128 pounds, and their pound containeth 14 ounces, and 100 pounds of their weight maketh at London 113;

Their Silk, Cloth of gold, and Woollen's measured with a measure which they call a cubic, containing about 2 of a Varre of Castile. Howbeit their common Measure is called a Varre, which maketh five Palms, and containeth 1 2 of a Varre of Castile, our Ell of Lowdon is equall with the Varre of Lisbone.

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Els, 100 Braces !

All kinde of Merchandize brought from Flanders, Roan, or Brittain, payeth at Lisbone. asa duty or custome to the King, 20 in the C. which they call the tenth in Merchandize, and the other tenth in money,

Note alfo, that all kinde of Merchandize comming to Lisbone by land, payeth leffe in cuhome then that that commeth by water.

comaketh at Anthony tract mestage, Su

The Rove of Civill is 30 pound, 4 Roves make their C, weight, which is 120 pounds. The 100 pounds of Civill maketh at London to pounds, Their other common measure is a Varre, whereof 100 maketh at London 74 Ells. ind at Rome 40 Canes, &c.

measures Braces, whered

At Venice be two forts of weight, the one alled la Groffe, the other la Suttle; with the nose is weighed all kinde of great wares, and ich the small all kinde of spicery, and such ke: 96 pounds of groffe weight there, mathat London 100 pound, and 100 pounds of icery there, without any tare or allowance, take at London 94, and with tare 65.

Their own common Measure are Braces, hereof 100 make at London 55 ! Ells, at

hewerp 92 :, &c.

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All kinde of Merchandize throught from Floring Roan, or, some Riorence, to and we not G fn

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At Florence the Too li, weight maketh a Aquila, for Saffron 110, and 145 pounds of Florence, make at Raan but 100 pounds the weight of Librence, and that of Luke is all

Their other measures are Braces, whereof 100 maketh at Antwerp, Burges measure, 81; Els. 100 Braces there, make at London 49 Els. ¢ & burg The Rove of Chair is a

make their C. rengue.

The Lucque Sattens commonly fold at Lieus by weight, and 133 pounds maketh at Lieus 100 pound, fo that I pound maketh at Line but one pound.

Their other measures are Braces, whereof 100 of them make at London 50 Els; at Am-Ac Venice be LV

werp &3 + Els, &c.

Aquila 1 Storio al bella

At Aquilatheir 100 pounds maketh at La don 71 1, their 136 3 pounds of Saffron maketh at Geneva but 100, and I li, of Geneva, Ma keth 15 li. at Aquilar moditive cornis vissign

Their own contiamo ave midl

makear I sador 94 ar with our

At Valentia be two forts of weights, a great Char and a small, The C, weight or great weight COR

Weights and Measures.

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contained four Roves, the Rove 30 life the Gogreat weight is 144 li. and the C. weight mall containeth but 120 pounds, and is also parted into four Roves, which is 30 pounds to a Rove. By the small is sold the starlet grain, with all other kind of Spicery, and by the great is sold Wood, with all such like grosse wares. The 15 pounds of Silk at Valentia, makethat Liouvione pound General weight. The charge of great Merchandize at Valentia containeth 432 pound, and in small wares 360 pounds.

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The weight here and at Barfettone is all one.

Their 100 pound weight maketh at London

Bround, at Antwerp 75, 2 and to ald Tart

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being reduced to an Armad . as followers.

At Dansick or Spruceland the rule is, that whosoever buyeth any Merchandize there, buyeth it by the ship pound, which is 320 li. 20 Lispounds make a Thip-pound, and the Lispound containeth 16 pound, which ship pound of Dansick maketh at Antwerp 266; li. Their too st. weight maketh at London 86, &cc.

Their other common measures are Ells, thereof 100 maketh at London 72 1, and at Antwerp 820 Ells.

Toulhoufe.

At Toulhouse 6 Cabes of Wood maketh a Charge, two Cisterns of Corn-measure, and all kind

kinde of grain maketh a Charge, the Cillera weigherh 160 Lweight of that place. Their 100 in weight, maketh at Lendon but 91 pound and Geans.

At Gende of Geans, 100 li. of their weight maketh at London 71 to and at Anthory 68 to 100 lis weight at Genna, maketh at Venice, to wit, Sattle 106 lis

Their other common Measures, are Palmer, whereof 100 make at Landan 20 \$ Eller and at

Answerp 34

The rest are supplied in two Tables, which hereaster followers: whereby the ingenious may eather his desire.

The Table of the agreement of the Weight of divers Countries, the one with the other, being reduced to an equality, as followeth.

	Antwerp Frankefond Colen and Amburgh Navembur Ross	107 1	(Venice gro	Since !
4	Frankeford	999	Weight,	2001
न्त्र	Colen and	2 Pagar	Venice Var	اوالاحتارات
17	Amburgh	Sauga-dink	the moigh	\$1663
-5	Narembur	g 1 1 00 4 18	nfancil 15	המווים כם
3	Roam	098	Aguina	1574
#	Paris . 8	102 257	Vienna	0894
48	Lions		Rreflam.	134 7
3	Doep	11001 2	Lospfig	IOI
de	Geneva	090 -	Danfick	1295
10	Towlonge	122 3	Lubeck	0974
2	Rochell	124	Lubeck Barcellon	144
=	Marfellis	1134	Lisbone	099
176	Sivill, de.	109	Lisbone Geans	1571
1	1 2 1000	The second second		The

Weights and Measures.

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75 Yards 2 London make at 565

The other Table of agreement of Measures of divers Countries reduced unto an equality, by the aid whereof you may with the use of the Rule of three, convert either more or lesse of any one Measure unto the other.

100
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125
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4 87 7
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57 Aulnes.
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8r (
81 (Varres.
1 62 3 W 1 W
108 7 Maria
120
122 Braces.
138
90-Canes.
288 Palms.

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The other Table of sense man of the checks of

The eighteenth Chapter treateth of Sports, and Pastimes, done no was by number.

ber that any man doth think or imagine in his minde, as though you could divine, bid them triple it, or put twice for much more to it as it is, which done, ask him whether

it be even or odde; if he fay odde, bid him take one to it to make it even, and for the one keep one in your mind. Now after ho hath taken one to a, to make it even, bid himgine away half, and keep the other half for himlelf, which when he hath done, bid him triple that half, and again, after he hath tripled it, askhim whether it be even or odde : if he fay odde, then hid him take one to make it even again, and for that tast one, keep two in your mind: now after he hath made his number even, bid him call away the one half, and keep the other still, from which half that he keepeth, canfe him fubtilly to put away or give you nine out of his number, as oft as he can, and for each 9 that he giveth you, keep 4 in your mind, and thereunto joyn the 3 which I bad you keep, and you shall have your defire.

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Example.

Imagine he thought 7 the triple whereof is 21, and because it is odde, he is to take 1 to make it even, which first x given, is for you to keep in mind. Then the half of his 22 being cast away, hereferveth still 11, which after you have bid him triple, it maketh 33: then in giving of him one again to make it even, upon that last 1 reserve 2 in your minde, then his half of 34 maketh 17; from whence he can give you 9 but once. Therefore that yeelding to you 4, and the 3 that you keep, make 7 your desire.

Another kind of Divination, to tell your friend how many pence or single pieces, reckoning them one with another, he hath in his

purfe, or should think in his mind.

Which to do, first bid him double the pieces he hath in his purse, or the number he thinketh, (if he participate his number or secrecy unto some me friend that sitteth by him that can but multiply, and adde never so little: if their number he great, then shall they work, as you bid them so

much the (urer.)

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Now after he hath doubled his number, bid him adde thereunto 5 more; which done, bid him multiply that his number by 5 also; which done, bid him tell you the just tumme of his last multiplication, which summe the giver thinkerh it nothing available, because it is so great above his pretended imagination: yet thereby shall you presently with the help of Subtraction tell his proposed number.

Pp

The

The Rule is this.

6	Imagine he thought 17, Double 17,
	and it maketh 34, whereunto if you
	adde 5, it maketh 39: which multipli-
	edby 5, as here is practifed, is yeelded 34
	195, which 195 is the summe delivered 5
	Rule you shall evermore cut off the last 39
	figure toward your right hand, with a
	dash of your pen as here is performed, as 1915
	a figure nothing available unto your
	work, and then rebate 2 from your first
	stigure, after 5 is cut off, and the rest
	example doth appear.
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Another of a Ring.

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If in any company you are disposed to make them merry by manner of divining, in delivering a Ring unto any one of them, which af ter you have delivered it unto them, that you will absent your felf from them, and they to devise after you are gone, which of them shall have the keeping thereof, and that you at your return will rell them what person hath it, upon what hand, upon what finger, and what joynt: Which to do, cause the persons tost down all in a row, and to keep likewise an or right he der of their singers: now, after ye are gon the likewise and the likew OUT 237 17

out from them to fome other place, fay unto one of the lookers on that he double the numbers of him that haththe Ring, and unto the double bid him adde 5, and then cause him to. multiply the Addition by 5, and anto the produck bid him adde the number of the finger of the person that hath the Ring. And lastly, to end the work, beyond that number towards his right hand, let him fet down a figure fignifring upon which of the joynts he hath the Ring, as if it be upon the second joynt, let him put down 2. Then demand of him what number he keepeth, from the which you shall abate 150, and you shall have three figures remaining at the least. The first toward your left hand, shall fignific the number of the person which hath the Ring, the fecond or middle mimbershall declare the number of the finger, and the last figure towards your right hand hill betoken the number of the joynt. the double to adde r, and the firm timme to

mulciple by 5, and up to the product adde the puines of one of the slemax ce and bedinde

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thornmoer towards the right hand to put the Imagine the fewenth person is determined to up the Ring upon the fifth finger, and the thind on : first double 7; it maketh 14; thereto adde. filt makesh 19, which multiplied by 5, yeldesh that Us, unto which 95, adde the number of the finger ofit ad it maketh 100; and beyond 100 toward the nor ight hand, I set down 3 the number of the gone my all maketh 1003, which is the namber OHE 237 13 that Pp2

that is to be delivered you, from which abating 205, there resteth 753, which presigners unto you the seventh person, the fift singer, and the

third joynt.

But note, that when you have made your subtraction, if there do remain 0, in the place of tens, that is to say, in the second place, you must then abate 1, from the sigure which is in the place of the hundreds, that is to wit, from the sure which is next your lest hand, and that shall be worth 10 tenths, signifying the tenth singer, as if there should remain 803, you must say, that the seventh person upon his tenth singer, and upon his third joynt, hath the Ring.

Another of three Dice.

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If a man do cast 3 Dice, you may know the points of one of every of them. For if you canse him to double the points of one Die, and to the double to adde 5, and the same summe to multiply by 5, and unto the product adde the points of one of the other Dice; and behinde the number towards the right hand, to put the sigure which signifies the points of the last Die, and then to ask what number he keepeth, from which abate 250, and there will remain 3 sigures, which do note unto you the points of every Die.

Another of things hidden.

If three divers things are to be hidden of

three divers persons, and you to divine, which of the three persons hath the three divers things do thus simagine the three things to be represented, A. B. C. Then fecondly keep well in your mind which of the persons you mean to be the first, second, and third. Then take 24 Counters or Stones, and your three things, and give A to the party whom you imagine to be your first man, and therewithall give him one of your 24 Counters in his hand. and E unto your fecond man, and therewithall 2 Counters, and C unto your third man, and therewithalf a Counters: and leave the rest, which are 18, still among them : which done feparare your felt from them; and afterwards bid them change the things among them as they shall think good : which done, after they are agreed, bid him that hath fuch a thing, as before you have represented by A, for every Counter that he hath in his hand, to take up as many more, And for him that hath B, for evewone in his hand to take up two. And for him that hath Co for every one in his hand to take up 4; and the reft of them to leave fill ponthe board. These 3 things, and the three persons being fully prieted in your mind, come to the Table, and you shall evermore find one of these 6 numbers, 1,3,3,4,5,6, or 7. If therefore one remain Itill upon the board, then have they made no exchange, but keep them still as they were delivered unto them. So that the first man hath A, the second nA Pp 3 B,

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B, and the third man C, but if a remain, then the first man hath B, your second man A, and your third man C. The grest of the work and the order thereof are here apparent by the Table following.

redT.	Driet	ane d	1000	Dillo	drade	d diene
inrec m voic Muhali basel	moy be	E	250	o enale	TOUR	32 63
nov m	CHA 6	B	df 05	5 3W	2 6	aguid.
Hadsiy	o ods t	05 C	in dine	mot	10/	13.
-Lust	1-1 tal 4	A	24.	HOV to	500	STIP STIP
-dilivi	i iii bi	B	m bno	6	2 031	100 6
Dais, die	in did.	in C	omu.	DIE	15 JAN	4 5 115
paon s	TSVES	DOE	21930	10.4	0. 6	er enegg
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verlies	100	A 10.	dier ap	DANAL	Je fl	HONE CITY
ya.u. 0		or Are	d ren:	mid L	d' bes	372 200

Another divination of a number upon the sol

First let the Caster cast both the Dice; and mark well the number: then det him take up one of them; it maketh no matter which, and look what number it hath in the bottom, and adde all together: then cast the Dicagdin, and keep in his mind what all together maketh then let the Dice stand, and bring seven with you and thereunto adde the rest of the pirs that you see upon the upper side of the Dice, and be many did the caster cast in all.

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An Appendix concerning the Resolution of the Square and Cube in Numbers, to the finding of their fide, by Ro. Hartwel.

Plain mate numbers

Figurage Number is a number made by A figure the multiplication of one number or number more by another. dies are mequall.

100 100 The fides of a figurative number are The fides the numbers by whose multiplication it is made, of a figu-

A figurate what.

leap ore that a tomod what ber what. rate num-

enightly operand the fame place anmber A Figurate number is two-fold, a

noin COf one Multiplica- 2 Plain. And tion. in hos as a

it is Or consequently of (wor) billion

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and Inaquilater.

A figurate number made of one multiplication, by two sides or numbers multiplied together, is called a plain figurate number.

Far every number made by the mutuall mul- A plain riplication of two numbers, may be called a figurare Maine, because it bringeth forth a right- number. angled parrallelogramme, according to his unities disposed in tength and breadth, the sides whereof are the two multiplying numbers. As the number 20, made by the mutuall multi-Plication of 4 and 5 is called a Plain, and Pp 4 the dist.

Plain figurate numbers.

the fides thereof are 4 and 5 as * * * * * *

here.

Because the unities thereof dif- * * * * *

posed in length and breadth, as * * * * *
the sides do expresse, do bring forth an interlater Parallelogram, for that the numbers of
sides are inequal.

By like reason 36 made by multiplication of 6 by 6, is called an Aquilater plain, forthe

fides thereof 6 and 6 are equall.

Moreover one and the same plain number may have many sides, as the plain number 24, hath sides 4 and 6: 3 and 8: 2 and 12. For it is produced from the mutual multiplication of these numbers: whereupon for the invention of the sides, to wit, in inequilater Plains, it is needful to give one of the sides, by which the plain it self divided, the other side is made known. As the plain 48 being divided by the side 8, the quotient 6 is the remaining side. Notwithstanding another resolution and inquisition doth happen in the sides of the Annilater plains.

An Equilater Plain or quadrat what.

An Aquilater plain is a number made by smo equall fides, for by any number multiplied by it felf. It is vulgarly called a fourie or quadray, by the Arabians Zensus, it is commonly expresfed by this note z, by us q.

A quadrat or square in Geometry, is called a right lined plain figure, made by four equal right lines, and so many right Angles, and every one of the lines is called the fide of the que

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om, as this figure abcd whole fide is a b, or b c, a as alfo c d, and a de ven ny be 196 5 To the fimilitude hereof that number is called 2 Quadrate, which is. made by the multiplica? tion of two equal numbers, or of one in it felf d of which manner 36 is steel as to be flowers of made, by 6 multiply in it felf, or by the mutual multiplication of 6 and 6. * * * * * For if 36 unites be placed in * * * * * phin form, it bringeth forth * * * * * perfet Geometricall Qua- * * * * * was, having in every fide fixe * * * * * unities as here. The number whereof the Quadrat is produced or root of

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root of the Quadrat.

by multiplication in it felf, is called the fide or a number

Concerning the extraction of the gradm Quadrat or fquare Root. the particular (quare of the last period, et-

THerefore to find the Quadrate root, or the In fide of any Quadrat number, is to fearch a number, which brought or multiplied in it felf, maketh the number propounded : concerning the finding whereof, as it is requisite that the fider (being leffer then 10) of the Squares wider an hundred should be gathered by the Table of Multiplication t fo the fides of the grea-

greater faires are to be fought out by- Art. First, the fquires whose fides are simple pun. bers, are here fet down as you feen had the

The roots.

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objection?

The fquares,

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4 9 16 2526 49 6418 0 0

The knowledge of a fquare is by finding out his fide expressed by a whole number, and ibidy to

Although the finding out of the fet of a fquere be applyed to each number given, is to a fquare, yet fquare numbers only have a fide to be expressed by a certain number of unitered by rational numbers, the other are obeexpressed but only in power. The fiderace commonly called Roots by a Metaphorisall phrafa.

The Root or fide of a Square is to be found by

10 3002 10 the Theorems following, a gumbe: 75 114

If the odde degrees of a square number being marked from the right toward the lefe hand with points, you funded from the number given, the particular square of the last period, setting the fide thereof alone by in felforal !

Then going on, if you divide the remainder (if there be any) with the figure going before it, by the double of the fide fed alone by it aing the finding wheredt as reas require : Hat

And meleipty the quotient, found ont (being 3. placed by the fide, which was first fer alone by it felf, and also before the doubled number

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on the right hand) by both the numbers (namely by the double number, and the Figure fet by felf) being counted as one divisor subducting the products from the given number, and then renue this last work of division fo many times sthere are pricks remaining, the fide of the fquare shall be found out. 1 310 319 11 11 11

This artificiall device is taken out of the 4 P.Z. Enclide. Where by demonstration it is proved, that if a right line be cut into two fegments, howsoever the square of the whole line is equall wahe squares of the segments, and the two light-angled figures made of the fegments as in To ex-

the figure annexed the regard of old and tract the mi Diagonals, kgi and a stopo b3c fare the squares of the egments, a be and he. K Alforthe complements kyand f gare thanight-100 welcd figures made by milisplying the line a b, ofich no idritos they are quall one or other) and allo the

square root

The felf-fame parts are to be found in any The first square number. As for example, let the num- example. fer be 169 whale fide is 13. This fide being divided into two pieces, 10 and 3, multiplying each piece by it felf once onknely, 10 by to, and 3 by 3 s then multiply one by another, soby 3, and 3 by 10, fo shall you have four bda numbers, whereof two are fquare, as here vide of which in this places and driver

There -

points, because the particular squares are to be found in the odde places. Then for so much as the unity standing under the first point next the less hand, and representing the last period is both a square and the fide of a square; that figure therefore being set alone in the question, and being subducted from the unity standing over the point, there remainers nothing.

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This unity set alone by it self in the quotien, shall signify 10, when another figure is set by it, representing the side of some other particular square. Whereupon I say, that the greater Diagonals kg, is now subducted from the whole square, and the side of it ki, or a b, (for they are equals one to another) and also the side of the complement is found out.

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Moreover I double the figure found out, because being doubled, it is the side of both the complement taken joynely together, namely, i, and gi. Then setting a the doubled number under 6, I divide 6 (which in this place is a much

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mich as 60, and representeth both the comlements) by 2, the quotient is 3, representing
the other side remaining of the complement,
miely, if, for ba, which number I set in the
motient, and count it for the segment remaining
of the right line given. Wherefore because this
number 3 is the side of the remaining Diagoull, that is to say, of the lesser square b f, therefore being set by the divisor on the right hand,
and multiplied by it self, and also by the divisor,
thringeth forth three plain numbers, namely,
the square b f, and the two complements a i,
this, which being subducted from the numters standing over them, there remaineth nohing.

The example is thus.

169

The subtilty of this invention is illustrated by The seuny examples.

Let the famore given be 1764. This number amp ting marked with two points, telleth us, that he fide thereof is to be written with two Fiates.

First,

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First therefore beginning at the point on the left hand, I feek the fide of the last period, namely, 17. But for fo much as it is no fourre number, Itake 4 the fide of the next leffer fquare, which I fer alone by it felf in the quotient, and then multiply it by it felf, the produtt is 16, which being subducted from 17, there refleth I. Moreover I double the fide found out. the product is 8, I place this doubled number under 6, and by it divide 16 ftanding above it, the quotient is 2, which must be fet by 4. This quoient 2 muft be fer before the Divifor 8, on the right hand under the point, and then moft it be muleiplied both by it felf, and into 8, the product is 164, which being subducted from the figures standing over them, there remaineth nothing: whereby I gather that the number given is a just fquare.

The Example Randeth thus.

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1764 The Collection,

mender, ample. The same manner of working is to be followed in greater square numbers given, saving that the former part of the work is to be used but

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once, but the latter part is to be followed fo maof times as there are points remaining sexcepting

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As in 5 47 56, I fay, that the fide of the Thethird fquare next unto 5 is 2: therefore 2 being fet example. in the quotient, and multiplyed by it felf, makes 4, and raken from 5, the remainder is 1. Moreover I double the quotient, the product is 4, which I fet under the next figure toward the right hand, and thereby divide 14, the quotion is 3, which three being fet both in the quotient, and also before the Divisor toward the right hand, I multiply both the numbers wit, the product is 129: this being lubducted from 147 standing above it, the remainder is 18. But because there is yet one point remaiing, with which I have not medled; I thereare again double all the whole quotient, for athis case I must take 23 for the side of one himer Canare, and generally in great numbers, Note. men I light apon more particular fquares ten ewo, I must effective them but as two, and the the fides which are first found out, but as he fides of one only fquare. Therefore wice 23 is 46: by this I divide 185, the umber to be fet in the quotient is 4, which miber allo must be fet before the Divisor on he right hand : then must 464 be multiplied 14: the product is 1856 this product being wed btracted from the numbers standing over it, eth thus, die but

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See alfo the Example following.

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Therefore out of this invention is this con-

ple of a furd number.

The number whose side cannot be expressed by whole numbers, is not a square number.

Such are all prime numbers, and (the squares themselves excepted) all other compound numbers. For if in them you desire to and out the square side, you shall labour in the square side, you shall labour in the squares, for to the whole numbers arising in the quotient, there will be some fraction adjoyned, whereby it commeth to palle, that the number of the side is not to be expressed by a true number, and it is commonly called a surd number.

Notwithstanding, if you adjoyn to the fide found out, the number remaining, taking his hold denomination from the double of the fide any thick

helied by an unity, you shall finde the next fide that may be like to the fide of a square.

As if from 40 you take the nearest fquare, to wit, 36, the remainder is 4. Here therefore the file fought for of the Square exceedeth not the fide found out by an unity, but either by one, or more parts of some whole number : wherefore I double 6, the fide found out, and adde in unity to it being doubled, the totall is 13, this number I fet under 4 the remainder, and hy that the fide of 40 demanded as near as may be, is 6 ; the Denominator of the fraction being added to the greatest square in the numbergiven, namely unto 36, maketh the next greatest square above it, namely, 49, whose side 17. But this furd fide, to wit, 6 4, multiplied by it felf, maketh 39 133, which are not just quall to 40, the given number.

Judge the like concerning the rest which are

not squares.

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Thus much concerning plain figurate numbers, but especially such as are square numbers.

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Concerning solid figurate Numbers.

A Solid figurate Number is made of two multiplications by three numbers or sides, multiplied together, admitting length, breadth, and thicknesse.

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gurate number.

A folid fi- Therefore every number made by the mutuall multiplication of three numbers, may be called a folid, because it bringeth forth a right angled parallelipipedon, disposed according to his unities in length, breadth, and thichneffe, the fides whereof are the three multiplying numbers. As the number 30 made by the mutuall multiplication of 2, 3, and 5, is called an Inequilater folid number, and the lides thereof are 2,3; and 5; because the unites thereof dispofed by a certain distance one from another, in length, breadth, and depth, as the fides doexpresse, do bring forth resemblance an Inequilater parallelipipedon, for that the numbers or fides are inequall.

> By like reason 216 made by multiplication of 6 by 6, and the product thereof by 6, is called an Equilater folid, for the fides thereof 66, and 6 are equall.

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An Equilater, is a number made by three An Equilater, Solid, equall sides, or by any number mulciplied by it or Cube. selfe, and that product again by the aforesaid number. And it is called an Equilater and Equi angled Parallelipipedon or Cute, and is commonly represented by us thus C.

> A Cube in Geometry is a right-angled Para lelipipedon having fix equall surfaces, and

The Cubick Roor.

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folid angles, and 12 fides, as this figure ab.c. d.e. f. g.b. whose side is ab, oradalfobc, orc deitherce, oref, likewise ch, or hg, allogf, or df, or la, and ga.

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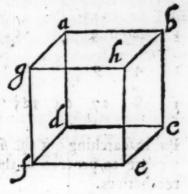
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The number whereof the Cube is produced by The fide Multiplication in it self twice, is called the side or root of proot of the Cube, which being found out in Cube. whole numbers, the Cube is known.

Concerning the extraction of the Cubick Root.

THerefore every Cube in numbers hath I fuch a fide as may be expressed in whole umbers, but in magnitudes it is not always efaid as indeed in magnitudes there are many lings not to be expressed in whole number, low for as much as the fide of any Cube under oon, is a simple figure, it is necessary, before e undertake to find out the fide of any great umber, to know what Cube is made of each ara ple figure, and what is the fide of any leffolia rthen 1000, as I have here fet them down. Roots Qq2

	2 3 4		
Squares. 1	4 9 16	25 36	49 64 81
Cubes. I	8 27 64	125 226 3	43 512 719

But in searching out the sides of greater Cubes, we are to proceed as the theorem following teacheth us.

If you distinguish with points as it were into periods, the given Cube beginning at the fift figure on the right hand, and omitting each two figures continually, and first of all sub. duct the particular Cube of the last period from the given number, fetting the fide thereof in the quotient: and then fet triple of the quotient under the figure next following the former point on the right hand, and the fquare of the quotient being tripled beneath it one degree more toward the left hand : and afterward divide the number above written by the triple of the square, setting the quotient by it self, and then multiply the divisor by the quotient found out, and the tripled square by the square of the quotient, and the quotient cubicully, subducting the products (To orderly added together, that each figure may answer the numbers whereof it was multiplied) from the number given, and renue this last manner of Division so many times as there are points remaining, the fide of the Cube shall be found out.

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This artificial device is drawn out of that theorem, which Ramus made, imitating that of Euclide, concerning square numbers in this manner.

If a right line be cut into two segments, the The ex-Cube of the whole line shall be equall to the traction of Cubes of the segments, and the two solid signres the Cubick comprehended three times under the square of his soot. segment, and the segment remaining.

As the line ti, which is 13, is cut into two

fegments, 10 and 3, therefore the Cube of the mole line, namely, 2197, is equall unto the Cubes of the Segments, namely unto 1000, and 27 also to the two-fold Solids or Parallelipipedons thrice taken,

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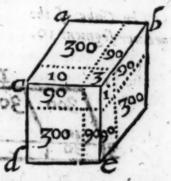
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whereof three have like solidity, the solidity of each of the three lesser is 90, being made of the square of the segment, 3, that is to be of 9, multiplied by the other segment 10. These three Parallelipipedons joyntly taken together, make 270. But of the three greater Parallelipipedons each containeth 300, being made of 100, the square of the greater segment 10, multiplied by the lesser segment 3, 2 q 3 and

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and they being taken joyntly together, make

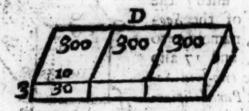


The Gube of .
the leffer fegment 3.



The Cube of the greater segment 10.

The 3 leffer Parallelipipedons.



The three greater Paralleli-

The Cube therefore hath eight particular folids in number, which are made of the parts of the number given, namely, of to and 3 in this manner. First, let there be four plain numbers made, each part being multiplied by it self; and one by another,

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ven. Sather the greater Cube Mistobe hop noted to be fundanced from the number diven

> your up to go to find and 30 -100

If again I multiply the Plains by the fame parts, there will arise 8 folids, as you see here. After I triple the question found outschat is

co fay, Landiply it by 3) tog triple ragelen setby be three fider (jountlogiken cogoper)of the three lefter foliate marlos with C. doplace the rapled number meder o Again, I multiply the anticut iquare-wife, and triple the gradual, which maketh likewife a This product refem-OI VI 2710 113 KE 90 3 All thefe being added diw go ism, 300 together, are equall to 190 300 the Cube of the whole, 1 100 1 1000 10 Wir, 2 197.

Therefore the fame way that is kept in making the Cibe, is also to be followed in resolving the Cube.

Polits in this manner, 2197.

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Then I subduce the particular Cube of the to extra t homber fet under the last point : but for fo bickroots much as that number is no Cube, I take the learest to it, namely, an unity, which also I set the quotient. This unity in the number given, is 100, but in the quotient it is but 20, me unite lubducted from 2, the remainder is r, which must be written over the number gi-Qq4 ven

ven. So that the greater Cube A, is to be sup-

This is the first step of this work.

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After I triple the quotient found out (that is to fay, I multiply it by 3) this triple representeth the three sides (joyntly taken together)of the three leffer folids marked with C, I place the tripled number under 9. Again, I multiply the quotient square-wise, and triple the product, which maketh likewise 3. This product resembleth the three fgnare sides fraken joyntly together) of the three greater folids, marked with D, I place the product on a degree lower toward the left hand underneath 1. With it I divide 11, which written above it, the quotient is 3. This segment or quotient 3, being multiplied by 3, the divisor maketh 9, which in respect of the place wherein it standeth, is 900, and representeth the three greater folids marked with D, taken joyntly cogether. Further more the same quotient being multiplied square-wife, maketh o, and multiplied after. ward by the tripled number franding under o, it maketh 27, which in respect of the place wherein it standeth, is 270, and representeth the 3 leffer folids marked with C. Last of all, the fame

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fame quotient multiplied cubically, breedeth the leffer Cube B. These 3 products therefore being added together, and the rotall subducted from the number's flanding over it, there remaineth nothing, which importeth the given number is a Cube. 16287054 (2

The Example is as you fee.

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3197 (13	1000 T	be greater C	ube. 8 mban
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g Or thus	: 900 The	3 greater P.	arallelipipe.
27 2730	270 The	le∬er Paral e∬er Cube.	lelipipedons.
2197 aniloc	2197		

The matter may be explained by many examples, The se-

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Let the fide of the given Cube 1638706A, ample of be fought out, contrive it therefore (as it were) the Cubick into certain periods with points. Then first of root. all, fearch our the fide of the Cube next to the left hand: But for as much as 16 is no Cube, take the fide of the next Cube under it, that is to lay, of 8, and fet in the quotient, and fubduct 8 the Cabe thereof from 16, there remaineth 8. The first work is not to be renued throughout the whole number, but the rules following must be repeated as often as there are points remaining. The

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The first step to finde out the rootse

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Moreover, triple the quotient now found out, and the product is 6, which is to be placed under 8, namely, under the figure following the next prick toward the right hand. Then multiply the quotient by this tripled number (or which is all to one purpole lquare the quotient and then triple the product) it maketh 12, let that number in a lower place one degree necrer the left hand, and make it the divifor : divide 83 by 12, observing this rule in choosing your quotient, that it be no greater, then that the numbers afterward produced by multiplication may not exceed the numbers standing over it. So that here you hall take I in 8, but 5 times, Afterward by this number 5, multiply the atripled number 6, and last of all multiply 5 cubically : to thall you produce three numbers, namely, 66, 156, 125, to be described in such fort as you see. These numbers added together, and fubducted from 8387, the remainer is 762.

The second step to finde out the root, in this manner.

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And because there is yet one point remaining, this last manner of Division must be wrought

again.

First, therefore I triple the quotient, the product is 75, which must be so placed, that the first figure thereof, namely 5, may stand under 6, the second under the o. Again, multiply the quotient by this tripled number, (or which is all one, square the quotient, and triple the product) it maketh 1875, which must be the Divifor, whose first figure, namely 5, must be placed under 7, the last figure of the tripled number Then fee that I may be contained in 7, many timet,but I cam take it but 4 times,I fet 4 in the quotient, and moltiply the Divisor by 4, the product is 7500, afterward I fquare 4, it maketh 16, which I multiply by the tripled number 75, the product is 1200. Last of alt, Pmultiply 4 cm bically, it maketh 64, these products added all togetogether, make 762064, which number being subducted from the Cube given, there remaineth nothing, whereby I gather that the number given is exactly cubicall.

The third step to finde out the side is in this manner.

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The third example of the Cubick root.

Rehold also the example following.

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Another manner of working.

Itherto the Princely bight way to find out the fide of the Cube hath been declared.

But there are moreover certain other ways also bending thereto, and leaning to the same principles, whereof this is one of the same

Having found out in the Table of simple cubes, the first figure representing the fide of the sube contained in the number standing under the first point on the left hand ser it in the quotient, and

The fecond form.

and fabduct the particular Cube of that figure as you did before then fquare that figure. and triple that Square, the product shall be the Divisor, the first figure whereof shall be fer under that figure which is on the right hand next of all to the point (now examined) before going.

See how many times the Divisor is contained in the number written over it, and multiply the Divisor in the quotient, and subduct the product from the dividend : yet here you must take heed, that you take not a greater quotient then that the product made afterward thereby may be subducted from the number given.

The fubduction being done, triple the first feure which was fet in the quotient, and adde to the triple the last number which was fet in the quotient on the right hand of the product.

This totall multiplied by the square of the figure last found out, and fet down the product fo, that the first figure thereof toward the right hand may stand under the point next before going on the same hand, and finally, subduct the ame from the number given.

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As in 8043 57, the particular Cube, namely, Thefourth 729 being taken from the number standing example of under the last period upon the left hand, there the Cubick remaineth 75357, the side of that particular root. cube being 9,I fet in the quotient. Then I fquare that side, it maketh 81, and triple the square, the product 243 is my Divisor, which I fet under the given number, fo that 3 may stand under 3

with

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with this Divisor, divide the number standing over it, you shall find z to be contained in 7 three times. Therefore I fet 3 in the quotient, and multiply the Divisor by it, the product is 729, which being subducted from 753, the remainder 24.

The induction is thus : and in the accessor white a secret, and have

5 the best billion at the graph as we will all all a for st of any product 754 months of months along 804357 (93 adorate tite. 243 729 dent, triple the

Moreover I triple 9, the product is 27, by which on the right hand I fet 3 the quotient

last found out, the totall is 273.

This number I multiply by 9 the square of the quotient last found out, the product shall be 2457, which being fubducted from the fuperiour number, there remaineth nothing,

The induction is thus :

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Anothermanner, 1911al adi lo

Hy felf fame work may be dispatched another way a little differing from the former.

in this manner.

The figure in the quotient, being found out by subducting the particular Cube, and also the second figure in the quotient being found by division, let the totall quotient be tripled, and let the tripled number be multiplied by the form. former figure in the quotient. Then let the product be multiplied again, by the latter figure found out, and let a cyaher be fet on the right hand of that product. Last of all, let the Cube, of the latter figure found out, be added to this product, and let the totall fum be fubducted from the number given: As in 373248.

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to a The first induction is in this manner.

m'i rammbers, von that reduce the nambersivenunto a entry 8 1000 of argreater demiminution, and afterward feek our the cabicall

343 . was bear tacht to old Moreover I fquare the fide found out,it ma- The fifth keth 49, and triple the fquare, the product is example, 147, which fiall be the divisor, by this I divide 302, the number written over it, the quotient is 2, Now I triple the totall quotient 72, it maketh 216, and multiply this triple by 7, the former figure in the quotient, the product is 1512. I multiply this product also by 2, the latter figure of the quotient, and fet a cypher on the right hand of it, so as it maketh 30240, unto this number last of all I adde 8, the Cube

of the latter figure found out, the totall is 30248 which being subducted from the figure above it, there remainerh nothing.

The second Induction is thus.

3900 of a 1500 o

To finde; the nearest Cubick root in a surd number. All the points of the number given being examined, if any thing remain, it figuifieth the number given is no Cube: wherefore the true fide of it cannot be exactly given in numbers. Yet if it please you to fift out the neerest fide that may be, by the first kinde of reduction of mixt numbers, you shall reduce the number given unto a cubicall fraction of a greater denomination, and afterward feek out the cubicall fide of that fraction.

For example sake, because 120 is no Cabe, therefore let it be reduced into sixty cabicall parts, after this manner. Multiply 60 cabically in it self, it maketh 216000, by this being taken for the denominator of the fraction, multiply 120 the number given, the product is 2592000 whose cubicall side is 25, that is, 4 the nearest to the true side that can be.

For the extraction of all forts of roots, the table of Logarithmes set forth by M. Brigges are most excellent, and ready.

FINIS.

A Table of Board and Timber measure, more perfect then ever bath been made; shewing also the Squares between 4 and 37 from quarter to quarter, valculated by Robert Hartwell.

Board measure	Inches&	Squares.	Timber measure	Board measure	Inches &	Squares.	Timber measure
36,0,0	4	16	08.0,2	16.0.0	9	81	21.3.3
33.8.8	OI.	18	06.0.0	15.5.6	I	85	20.3.3
2000	2	2	86.4.0	15.1.6	2	90	19,2.0
30.3.1	3	2	78.5.4	14.7.7	3	95	18.1.8
28.8.0	5	30	69.1.2	14.4.0	IO	100	17.2.8
7:4.3	I	27	64.0.0	14.0.5	1		16.4.6
16.1.8	2	35	57.6.0	13.7.5	2	110	15.7.1
5.0.4	3			13.3.9			15.0.2
4,0,0	6			13.0.9			14.2.8
23,014	I			12.8.0		126	13.7.1
12.175	2	00		12.5.3	W 2 C 2		13.0.9
11.3.3	3	45	38.4.1	12.2.7	3	138	12.5.2
10.5.7	7	49	35.2.6	12,0,0	12		12.0.0
19.86	I	52	33.2.3	11.7.5	İ	150	11.5.1
9,2,0	2	56	30.8.6	11.5.2	2		11.0.7
8:5:8	3	60	28.8.0	11.2.9	3		10.6.6
18,0,0	8	-		11.0.7		169	10.2,2
17.4.6	00011		25.4.1	100 100 100	1	175	43
16,9,4			24.0.0		2		9.4.6
16.4.6		76	22.7.5	10.4.7	3		9,1,4

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Board Simeasure	Fimber Board - Simes Meafure meat fures für	Timber measure
10.2.8 1	4 169 8.8.1 6.8.6	21 441 3 . 2.3
10.1.1	1 203 8.5.1 6.7.7	14513.8.2
9.9.3	2 21 0 8 . 2 . 3 6 . 6 . 6	2 462 3.7.3
9.7.6	3 21 7 7 . 9.6 8.6.1	3 473 3.6.5
9.6.0	15 225 7.6.8 6.5.4	22 484 3.5.7
9.4.5	1 232 7.43 6.47	1 495 3149
9.2.9	2240 7.20 6.40	2 506 30461
9.1.4	3 248 6.9.7 6.3.3	3 517 3:303
9,0,0	16 256 6.7.5 6.2.6	23 529 347.7
8.8.6	1 267 6.5.4 6.1.9	1 540 34200
8.7.3	2 272 6.3.5 6.I.2	2 552 31103
8.6.0	3 380 6.1.6 6.0.6	3 564 3.0.6
8.4.7	17 289 5.9.8 6.0.0	24 576 3.00
8.3.5	1297,5,8.1 5.9.4	1 588 2.9.4
8,2.3	2 306 5, 6, 4 5.8.8	2 600 2 8 6 8
8.1.1	3315 5.4.8 5.8.2	36122812
8.0,0	183245.3.3 5.7.6	25 625 27 6
7.8.9	1 333 5.1,8 5.7.0	1 637 27 1
7.7.8	23425.0.5 5.0.5	2 650 21605
7.6.8	3 351 4.9.2 5.5.8	3 662 2,630
7.5.8	19361,4.7.8 5.5.4	26 676 2.5.5
7.4.8	1370,46.75.4.8	1 689 2.7.0
7.3.9	2 380 4.5.5 5.4.3	270224.7
7.2.9	3 390 4.4.3 5.3.3	0.00
	20 400 4.3.2 5.3.8	
7.2.0	1410,4.2.1 5.2.8	1742 2.3.2
7.1.1	24204.1.1 5.2.3	
6.0.2	3 43 1 4.0.1 5.1.8	3 767 1.2.4

Board mea-	nches &	durke	Timbe	Board measure	ches &	Juares	Timber
5.1.4	28	784	2.2.0	4.3.6	33	1089	1.5.9
5.0.9	-	798	2.1.6	4.3.3		1104	
5.0.5	2			4.3.0	1.2		1.5.4
5.0.0	3	826	2.0.9	4.2.7	3		1.5.2
4.9.6	(29	841	2.0.5	4.2.3	34	1156	1.4.9
4.9.2	0 30			4.2.0		1174	
4.8.8	2	871	1.9.8	4.1.7		1190	
4.8.4	3	883	1.9.5	4.1.4	3	1210	
4.8.0	30	900	1.9.2	4.1.1	35	1225	1.4.1
4.7.6	I	915	1.8.9	4.0,8	I	1237	1.4.0
4.7.2	2	930	1.8.6	4.0.5	1000	1247	11 12 12
4.6.8	3	945	1.8.3	4.0.3	3	1280	1.3.5
4.6.4	31	961	1.7.9	4.0.0	36	1296	1.8.3
4.6.1	, I	-		3-9-7	, -	1313	1 -4 - 5
4.5.7	2	987	1.7.5	3.9.4		1331	
4.5.3	3.		4.0	3.9.1	3	1350	-
4.5.0	3 2	1034	1.6.9	3.8.9	37	1369	-
4.4.6	-			3.8.7	01	1388	
4.4.2			-	3.8.4		1416	- 4
		1072	-			1425	

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The use of this former Table.

If upon a Scale or Ruler you divide one inch into ten equall parts or primes, and again by diagonals, and parallel-lines; you subdivide each of them into ten equall parts or seconds, with your compasses, you may take a more exact running measure for board and timber, then by any other means whatsoever, and so plate the same, or this Table if you will, upon any Ruler.

Also by means of the columnes of Squares, you may readily finde a square equall to any Parallelipipedon, or piece of timber, which is thicker then it is broad. As for example, suppose a piece of timber to be ten inches thick, and 9 inches broad: if I multiply those sides one by another, they will produce 290, then seeking the columne of squares for 290, which I finde not, but I finde 280 the nearest number to 290, to stand against 17: therefore I say 17 inches fere, will make a square equall to such an unlike squared piece, then looking in the columne of timber measure against 17, you shall find that 5 inches, 9 primes, or 12, and 8 seconds,

or ... of an inch in length, of that piece will make a foot of timber.

how much in length of breadth of board must be in one foot.

By the like means, suppose for example that a board, appointed to be measured, is is inches broad, if I desire to know how much in length thereof will make a foot; I seek in the columnes that stand under unites and quarters, for 15 \frac{1}{4}, and also against the same in the columne under the title of board measure, where I finde 9 inches I prime, or tenth of an inch, and 4 seconds, or hundreds of an inch will make a foot at that breadth: The like may be practised for any other breadth of board whatsoever.

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Certain Tables shewing the Interest of any summe of mony whatsoever unto 40 yeers; how much Annuities respited or forborn commeth unto. And for buying or selling of Annuities for the said time; and also the same in reversion after any number of yeers unto 30. What they may be worth in present ready mony, by R. C. and now diligently corrected and amended by Robert Hartwell.

Definition of Interest.

PRincipall, is the summe from which the Interest is reckened.

2 Interest is the summe reckened for the leuding or forbearance of the Principall for my terms or time.

3 Interest simple is that which is counted from the Principall only.

for the Principall, together with the Arrerage.

5 Interest profitable is that which is added to

the Principall.

6 Interest Damageable is that which is to be subtracted from the Principall.

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interest upon interest after 10 in the 100 comes to every yeer under 41 years. As followeth.

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die die	yeers	li.	5.	de	es d	li.	-	_	yeers	ean
Sust	JAN.	10	2	0	Lines.	7	08	10	21	o mp
brit	11211	Or	14	12	.1.	8	2	9	22	ilw
	3	1	6	7	A. C.	8	19	1	23	7110
	4	I	9	6. 16.3	deure	0	16	-	24	***
	5	I	12	_	26	_	16	8		
12	6	I	15	11.01	-11	-	18	-		21
311	_	-	_	-	40.7	LI		4	26	
40	7_	I	18	11	6.00	13	2	2	27	1
ir.	8	2	2	10	77 9	14	8	5	28	ha
, ni	.9	2	7	3	din.	15	17	3	29	1 8
ng l	TO	2	II	10	10.3	17	8	11	30	21115
	II	2	17	I	.20	19	3	10	31	iig
100	12	13	3	9	1 :	21	2	3	32	8
ye	13	3	9	20	ile	23	4	6	33	9 31
ni I	14	3	-	-	911		-		1.115.53 1	901
.14	15	-	15	11	nyd .	25	10	II	34	
aril.	16	4	3	6	101	28	2	0	35	1 33
NO.		4	-	10	1 1	30	18	0	36	
20 0	17	5	1	i	J. C	34	0	0	37	
* ***	1.8	5	II	2	3, 1	39	8	I	38	9.17
0 1	19	6	2	3	tal &	41	2	IO	39	,,,,,
	20	6	14	6		45	-	2	41	1

By the former Table, if you defire to know what I li. commeth to with interest, and interest upon interest after 10 in the 100, for any number of years unto 40. Look in the row, or margent (over which is written years) and against it on the right hand close unto it in the row or margent of pounds, shillings, and pence, (which is titled thus, li. s. d.) you shall finde your desire.

Example.

I would know what I li. with interest, and interest upon interest commeth to in 7 years?

I look in the row of years for the number 7. and against it on the right hand I finde 1 li, 18 s. 11 d. Also what it commeth unto in 13 years. I seek among the years for 13, and

against it I finde 3 li.9 s.

Again, for 21 years. I look for 21 among the years, and I finde 7 li. 8 s, o d. But if you would know for a greater fum then 1 li. Then multiply your fumme by that fumme of 1 li. in the Table for any of those years, and you shall easily finde it. As thus, I would know what 10 li. commeth to for 7 years with interest, &c. I see that 1 li. commeth to 1 li. 18 s, 11 d, in that time. Then say I that 10 li. must be 10 times as much in that space, which is 19 li. 9 s. 2 d. Also of 10 li. in 13 years. I see that 1 li. in that time commeth unto 3 li. 9 d. Then must to li. be ten times as much in that space, which

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is 24 li. 105. Also what to li. commeth to in ar years. I finde first that The in that foace commeth to 7 li. 8 s. Then I fav to must be to times as much, which is 74 li. Lastly, I would know what 100 li. commeth to in 7 years, I fee it must be 100 times as much as I li. commeth to in that fpace, whiches 194 li. 11 5. 8 d. Hereby you fee the common faying is not true, that 100 li. doth double is felf in 7 years, for it wants thereof 5 li. 8 s. 4 d. But in 8 years 100 li-commeth to 310 li. 8 s. 4d. which you fee is more then double it felf by 10 118 8 5. 4 d. And in this fort may any that can but cast with Counters, or indeed by memory finde the increase of any summe whatfoever for any of the number of years in the forelaid Table, after they have found what I li. commeth unto for that time, as before is fpecified.

A Table shewing if I li. annuity to endure for any number of years, under 41, be all respited or forborn, untill the last payment grow due, and then all be received together, with interest, and interest upon interest after 10 in the 100 per annum,

Appuities respited.

annum, what they will amount unto by any of the said number of year esul As followether than

91-12		4. 1	which	gen,	al i	0 25	mit	OF
Mecra	li, s.	do	room	341,	1 S.	d.	yeers	W
121		0	corsd	164	3:0	10	211	oy
190	SHOUL	0	say space	78	. 8	10A	(22)	i
131	31116	2	outee c	79	10	10	23.	11
1415	4 010	10	and at	88	1.9	-11	24	-1
: 51	6: 2	1	109:50	98	6	1	29	ye
6	7 14	3	imeth id	144	A	-	-	0
7	9 9	8	10112-510	121		-	200	
8	11 8	8	: 514° (11°	334		, Z	100	
9	13 14	7	CO. A. C. MO H. M. L.	148	THE RES	- N. Mar. 13	194	
10	14 18	8	ale of a	164	10	-		m
11	18 10	7	onius o	181	191		BEDAP	
12	23 7	8	en chi	201		2 5	3210	
13	24 10	5	ומנ נווה.	Resident St			39	
14	27 19	5		245		6	34	313
15	31 15	9		271		5	35	
16	35 18	7		299	2	6	36	
17	40 10	10		33°	0	9	37	
18	45 11	11		364	0	10	38	
19	51 3	2		401	8	11	39	
20	57. 0	6		442	11	10	40	

A Table parking if the country to allers

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By this Table you may know what any Annuity being respited or forborn for any number of yeers unto 41, with interest upon interest, after to in the 100, will come upon first seeking in the Table, what I is will come unto, in that time, and that being found to multiply it by the summe you desire to know.

Example.

First, I would know what this Annuity being forborn or respited for 14 years comments unto.

I look in this last Table (which is for putpose) and I find 27 hier 5 deman rather of

Again, what I li. Annuity respited for 21 years commeth to, I look in the faid Table for 21 yeers, and I find 64 li. Also the like for Ili. for 30 yeers respited. I look, and find it to be 164 li. 9 s, 10 d. as by the faid Table may appear. Now for greater Annuities, as 30 li. per annum, respited or forborn, what it amounteth to in 16 years, I feek first for 1 li, in this last. Table before for 16 yeers; and against it I find 35li. 18s. 11d. Then fay I, that 30li, per annum being respited for that time, will come to 30 times as much, which is 1078 li.7 s. 6d. Also if there be an Annuity of 45 li. due and unpayed for 12 yeers, I look in the faid Table what I li, commeth to, 12 yeers being respited, and I find it is 21 li. 7 s, 8 d. Then I conclude that

s li. must be 45 times as much, which is 962

Lastly, I have an Annuity of 50 lisper annum, which hath been behinde for 16 years, and must be answered unto me with interest, and interest upon interest, all at one payment, what shall or ought I to receive in all, at the 16 years end?

I seek what I li. comes unto in that time (as before taught) and I sinde 35 li. 18 s. 11 d. Then must my 50 li. per annum forborn for that time, come to 50 times as much, which is 1797 li. 6 s. 10 d. And thus may you finde any other summe great or small, for any number of years contained in the foresaid Table, without the help of Arithmetick, if you can but use your Counters, or by memory count well.

A Table shewing if 1 li. Annuity (to indure for any number of years unto 41) be to be sold for present ready money, bow much ought that ready money to be, reckining 10 per 100 per annum

annum abating interest, and interest upon inte-

K 1131 30	112	0 0	rate.	1000	15.	0.11	d	denz.	ness
yee rs	-	5.	d.	40.4	11:	5.	V IO	yeers	3111
67 79 .	0	18	2	dias	8	12	ÍI	211	dir
no Ta	T	14	.8	10 .0	8	10	5	22	11.0
160 Puls	72	9	8	ogo	8	17	7	23	5.9
3	-	-	-			-/	_		13/3
V And	3	3	14	1 (60)	8	19	8	24	el.
510	3	15	9	2.1	9	. 1	6	25	Al c
1016	4	7	1	011	9	3	0	26	diffe
7		18	4	test	9	4	8	27	ivi.
8	3	6	8	19 96	9	6	I	28	1163
-		-	-	a solo	-	-	141	-	9.00
1 9		15	2	101	9	7	4	29	I
IO	6	2	IÇ	l bai	9	8	. 6	39	1110
II	6	9	9	WOV	9	29	57	38	244277
120	6	16	35	a bot	9	10	-	122	iii
913	7	2	3	1 30 8	_	11	1	33	CHILI
14	-	12	P	36 4	9	4	4		nic
1	7	7	-4	te of	9	12	2	34	n G
15	7	12	1	1 31	9	12	10	35	1111
16	-	16	5		9	13	56	36	200
1757	8	0	TE	winds	-	14	100	-	1
18	8	-	2	514	2		7	37	1187
	Commercial Co.	4	10	9017	9 9	14	7	38	17.0
19	.8	7	3	1	9	15	I	39	1033
20	8	10	3	1 1	9	15	6	40	11

ya. day Then fay ther the America of 20 li.

will come to 20 time, as quech;

worth 147 li. 6 s. Sd. according to

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This Table before last specified is very he cessary and commodious for all Gentlemen or others, that shall have cause to buy or sell Annaities or such like, for by this they shall know what they do, whether they demand, or take too little or too much, after the rate of ten in the 100, by which proportionall these Tables are ruled.

As for example, I am to buy an Annuny of 16 li. per annum, for 12 years, and am demanded for it ready mony 120 li. I would know, if I give this rate, whether I give too much or too little, according to the proportion of 10 in the

100 per annum, che.

I look in the Table last before what I lie is worth for 12 years, and I find against 12 this jumme & lie rose 3 d. Now I say that 16 lie Axnuity for that time, and after that proportion commeth to 16 times as much, which is 100 lie So that I see the party demanded of me 11 lie too much after the rate of 16 in the 100 per annum, and therefore I must draw him to a lower price, or leave it.

Again, I am offered an Annuity of 2011, per annum of 14 years for 130 til. I would know if I give too much or tao little;

according to the proportion aforesaid.

I feek Hist what I li. Annuity is worth for 14 years, and I find in the said last Table 7 li. 7 s. 4 d. Then say that the Annuity of 20 li. per annum, will come to 20 times as much, and will be worth 147 li. 6 s. 8d, according to the

the proportion before mentioned and is more then his demand by 17 ll. 6 s. 8 d. So that I fee if I accept of it, I shall have a good bargain. And thus may you know readily by looking in your Table, and finding what I li. is worth for any time therein contained, how much any greater summe will come unto if you multiply it by that summe of I li. as before is sufficiently shewed.

But suppose this I have 300 lis ready mony, and would bestow the same for a valuable Annuity answerable thereunto according to the proportion aforesaid. I would know what Annuity to endure, 2 1 yeers this 300 li, will buy?

Hook in the former Table what I li. Annuity will cost for that time, and I find 8 li. 12 s. 11 d. Then I say by the Rule of proportion. If 8 li. 12 s. 11 d. will buy I li. Annuity for 21 years: what Annuity shall 300 li. buy or be worth for that time? I reduce the summes to the least denomination (which is pence) and I find 34 li. 10 s. 9 d. And after this manner (by the help of this rule) may you find all other summes for any time contained in the foresaid last Table.

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A Table Sheming what I li. in reversion for any number of years under 31 is warth in ready money, the buyer staying untill the thing be fall inband. our falls, ere lieding with

ycers	0 1	8	-	ome.		.	s.	ď.	yeers
2	200		6		=	0	3	11	17
3	0 1		200	3010	17	0	3	7	18
\$14	0 1	2	3	Cone		0	2	1	20
7	-	0	3	blue in the	-	0	2	2/2	21
8	0	91	3	000		•	2		13
9	00	8	8	113-11	11	0	1	10	24.1.9
11		6	•	07.70	-	0	1	8 6	26
13	0 0	3	9	Ha.D	. 3	6	1	4	28
14	0	3	3	part	10 32	0	1	3	29

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This last Table different, and is contrary to the other three before mentioned: For whereas the others increased more and more according to the number of years specified, this doth grow and diminish lesse and lesse, as the number of years increased. As for example.

There is a Tenement, the fee simple whereof after 7 years will be worth 40 li. what am I so jine for it in ready many, now staying untill it fall in hand?

To know this I look in this last Table for 7 years, and against it I find 10 s, 3 d. So that a thing that after 7 years will be worth 1 li. is worth now in ready mony but 10 s. 3 d. Then ay I, that the foresaid Tenement (which after 7 years will be worth 40 li) is now worth 40 times 10 s, 3 d. which is 20 li. 10 s.

Again, there is a Farm which after 9 yeers will be worth the Fee-simple 420 li. What is it now worth in ready mony, staying untill it fall in hand?

I look in the said Table what I li, is worth in Reversion after 9 years, and I find 8 s. 5 d. Then say I, that the Farm of 420 li. so long in Reversion, will be now worth in ready mony. 420 times as much, which is 176 li. 15 s.

is

Lastly, there is a Lordship to be sold, the Fee-

li. I would know what the same is now worth in ready mony for the Reversion.

I look in this last Table for 14 years, and against it I find 5 s. 3 d. so much 1 li. is worth in reversion after 14 years. Then say I, that 7500 li. is worth no more in reversion for that time then 7500 times 5 s. 3 d. which is 1968 li. 15 s. And after this manner may you finde out any other summe what soever. And though some men of their own experience can aime (as they think) near enough the mark to serve their own turns: yet I dare undertake they shall never so exactly doe it, nor justific what they doe, as if they did it by Art.

in I there are forefaid T a mean (which all he green will be worth as file a cover worth as there are a supplied by the cover worth as

Action riese is a sear which hipser is grown with a rese from a second. Where is it

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Lastly siere is a Lord's in to be folly in the Company of

New Tables of Interest at 8 per centum per annum, exactly calculated for 30 years by Robert Hartwell, with necessary questions for the use of them.

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The first Table expressing the increase of one pound principall, put out and farborn for any number of years under 31, at 8 per centum per annum.

years.li. s. d. q.	li. s. d. 19. lyears.
70	3 8 60 16
3 1 5 2 1	3 14 00 17
4 1 7 2 2	3 19 00 18 4 6 33 19
5 1 9 4 2 6 1 11 83	4 13 2 7 20
6 III 8 3 7 I 14 3 I	5 6 8 0 21
8 117 00	5 8 8 3 22
9 119113	6 6 93 24
11 2 3 2 0	6 16 1 2 25
11 2 6 7 2 13 2 10 4 1	7 7 11 0 26 7 19 90 27
13 2 14 42	8 12 6 2 28
14 2 18 8 3	9 6 40 29
5 3 3 5 1	10 1 30 30

S1 2

The

618 Interest upon Interest respited.

The description and use of the Tables of Interest at 8 per annum, being profitable.

The first of them.

The first and sourth whereof is written over the head, years, and under the first number of years descending from 1 to 15, likewise in the sourth the number of years descending from 16 to 30. And against every year in the second Columne, toward the right hand the pounds, shillings, pence, and farthings, which one pound, or 30 s. principall will amount unto, being put forth and forborn for the number of years set against it; but the pounds, shillings, pence, etc. in the third Columne belongeth to the years set in the last Columne.

z Example.

Let it be required what one pound or 20 fillings, being put forth and forborn for 12 years, ariseth to as 8 per centum, per annum, interest

apon intereft.

Seek in the first Columne under the title of years, for 12 the number of years proposed in the question, and right against it toward the right hand in the second Columne, you shall find 2 li—10 s—4d—1q. which is the principall and increase thereof due for the time required.

2 Example.

If 100 li, be put forth for 17 years according

Interest upon Interest respited. 619

to the same interest, I demand what it will a-

mount to in that time ?

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Look in the Columne under the title of years for 17, and right against it towards the left hand in the Table is found 3 li—14s—0 d.
—oq, which is the increase of r li. by which you may thus gather li s d q the increase of 100 li. 300—0—0 or any other summe; 70—0—0 o a hundred times 3 di.

is 300 li. then 100 370—0—0 o times 14 shillings is 70 li. both which added together do make 370 li.—0 s—0 d. which is the increase of 100 li, put forth and forborn 17 years the solution to the question.

3 Example.

Suppose 60 li, be put forth for 19 years according to that rate, what will it increase to in that time?

Seek 19 under the title of years, and against it toward the left hand is found 4 hi 6 s-3

d-3q. now fay 60

times 4 li. is 240, li—s—d—q and 60 times 6 fbil- 240—0—0—0 lings is 360 fbil- 18—0—0—0 for times 3 d. is 180 3—9—0 d. or 15 fbillings, and 60 times 3 far- 258—18—9—0

things is 3 Shillings

9 d. all which added together make 258 li.18 s.9 d. the increase thereof demanded.

Sf 3

The second Table shewing what one pound annuity or yearly rent is worth at the end of any number of years under 31, being forborn, at 8 per centum, per annum.

yeers	li.	5	d.	q.	02	lin	5.	d.	q.	yeers
		0	-0	0	0	30	6	5	3	1.6
2:	- 2	-1	7	0	-	-33	15	0	0	17
3	3	4	Î	0	570	37	9	0	·c	18
4	4	10	T	I	441 6	41	8	11	0	19
5	5	17	-13	3	rice	45	15.	. 2	3	20
6	7	6	8	0	100	50	8	5	2	21
7	8	18	5	I	olom	55	9	-1	-	22
8	To	1.2	8	883	ci.to	160	-	10	1	22
9	IZ	9	9	10	71:3	66	15	3	2	24
10	14	9	8	3	and the	73	2			25
I	16	12	IC	- 2	27.13	79	-	<u> </u>	0	26
12	18	19	0	2		87	7	-0	c	727
13	21	9	10	2		105	6	T	2	2 0
14	34	-	3	02	04	103	19	2	3	20
15	27	3		2	181	III	5	7	3	30

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g di all wheen เมื่อประชาการเกิด พ.ศ. 6- เมษา มาไว้เมษาย์ ประชา

232

The uje of the second Table, (whose disposition is altogether like the former) according to the tule thereof, being profitable. Hen I widw : hans h --- Tkample. on and no ther 40 is 2700 li 60 2700-0-0-0 There is a Leafe worth 28 li. per annum, to endure 14 years, I demand what it will rife unto at the end of those years, being all forborn with the interest upon interest at the rate prescribed in this Table. 17 -7475 08 10 29 mil 11 1081 - 2 d. all which together amount onto 2744 Look in the third Table for 14 years, against which toward the right hand, you shall finde 24 li-4s-3 d-2 q. Now multiphy 28 li. by 24, there arifeth 672 li. then 28 li. by by sit yeeldethe to soul sit history born 112 s. on 5 Hill 12 s. lims Again 28 li. by 3 d. 672 0 0 0 0 produceth 84 d. or 5 12 0 0 7s. finally, 28 by a farthings yeeldeth - 1 1 1 1 --- 2 --- 0 56 farthings or Its 2 do: All which ad- 678-0-2---ded together make and won pride and 678 libos. 2 d. to be received at the end of 14 years, the same tent or annuity being respited. II - 81 - 7 forc I take of 8 li. 18 : 2 Example seidadwap z.b.z

in the firmer top 1 & ceived as was required.

years: I demand how much it will increase at the and of the said term?

In the Table I find that a pound in 20 years
will arife to 45 hi-15 s2d-3q. therefore
60 li, in the like term will yeeld 60 times as
much; which I will
reckon thus: 60 times li-s-d-q
45 li. is 2700 li. 60 2700-0-0
times 15 s. is 900 s. 45-0-0-0
or 45 1. 60 times 2 d.
is 120 d. or 105, laft
of all, 60 cimes 3 q. is
180 farthings, or 30 2745-13-0-0
-2 d. all which together amount unto 2745
li-135-0 d. the value thereof cobe
received at the end of the termi
- B Promisto

The yearly rent of 1 h. 13 s. 4 d. being behind and unpaid the space of 7 years at the end of which term the Tenant is compelled to pay the fame with the interest thereof according to the above named rate. I demand what the payment ought to be.

The increase of 1 li. yearly rent answering to 7 years, is 8 li. 185, 5 d. 1 q. which for 6 li.

li. 10 s. 7 d. 1q. now because 13 s. 4d. is two lies de third parts of 1li. therefore I take; of 8 li. 18 s 5—18—11—2
5 d. 1 q. which is the increase of 1 li. forborn for 59—9—6—3
7 years, that is 5 li. 18 s

11 d. 2 q, which together make so li. 9 s. 6 d. 3 q, the summe to be received, as was required.

The third Table declaring what one pound due at the end of any number of years under 31 is worth ready mony at 8 per centum, per an-

year	s li.	16.	d.	19.	1	7.24	ili.	s.	d.	q.	усага
1	0	11	7	0	920	0 37.0	0	0	10		16
2	0	17	10	3	Ca		0	5	4	3	17
3	.0	Is		2			0	5	0	0	18
4	0	14	8	I	li si	ov.	0	4	7	2,	19
5	0	13	7	1	10	Solle	9	4	3	I,	20
6	0	13	7	0	W.	egni	0	3	11	2	21
7 8	0	11	8	1	0513	ngi	o'	3	8	0	22
8	0	10	9	2	h 1		O	3	4	3	23
9	0	10	0	0	Figu	Eggi	0	3	I	3	24
10	0	9	3.	0	100	war	0	2	11	0	25
11	0	8	6	3	1/3/10	it W		2	8	I	26
12	0	7	11	I	usi.	adi.	0	2	6	0	27
13	0	7	4	0		. ,	0.	2	3	3	28
14	0	6	9	2	10	2 3	0	2	1	3	29
15	0	-	3	3	,		0	1	II	3	30

q

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s then 500 times 8 d. :

624 Interest upon Interest present?

This third Table is disposed as the first, the use according to the Title thereof, being damageable.

TExample.

Suppose there is 750 li. due to be payed at the end of 9 years, the Creditor would sell this debt for present many, what ought that many to be at the rate described in the Table?

Seek in this third Table for 9 years at the left lide of the Table, and right against it to-ward the right hand, you shall finde 10 shillings, which multiplied or taken 750 times, yeeldeth 7500 shillings, which is 375 di. the value of that debt in present mony.

2 Example.

There is a Leafe worth 500 li. after the end of 7 years; what is it worth present mony, according to the rate described in the Table staying till it full?

I feek in the Table for the 7 years, and right against it I finde 11 s—8 d; now I multiply 500 by 11, it yeeldeth 5500 shillings, or 275 li——s——d—q li. then 500 times 8 d. 275—0——0—0 maketh 4000 d, which 16—13—4—0 is 16 li. 13 s. 4 d, which added together is 291—291—13-—4—0 li. 13 s. 4 d, the value of the Lease to be paid before it fall in hand.

The fourth Table expressing what one pound pearly rent or annuity for any number of years not exceeding 30 is worth ready mony at 8 percentum, per annum.

yeers	11.				dur	218	rali.				yeers
-	0	-	-	-	13		8	17	0	DH	16
31	1		7.		1 7	30	9	2	3	0	M.I
Bir	13,5	11	6	2	E.c.	orl	9	7	115	1	Mus
4	3	6	2	3	1	- 11	9	.12	0	301	19
5	13	19	10	I	olg	. HOY	Tio				
6	4	12	5	1				0			_
7	5	4	Seal.	2	23,17	33 }	10.		-	_	
							40				
9	6	4	11	I	EV	MON	10	10	6	76.	24
	6	-		1	8: 7	e	10				
	7		-		1 bi	5 .	10				
	7	-			1 . 100	Ho	10				
-	7	-				nin i	10	I	0	0	28
	8	-2	1	13	6100	15 15	11				
	8	16	10	2	1891	ois i	11			-	

icia 60 and 140 times 7 s. ii s d

so 980 sior 40 ii ; likewiic : 60 - 0

a do times rd, 8 700 d. or 40 - 0

a lies8 so 4 d. and 1 ro / s. 2 - 1 ii d

added top a her maket 3 it

lies so d. ior the value of 1 : 1 : - 2

the faid Leaf paying no rese.

The fourth Table is disposed altogether as the former, and the use thereof in like fort being damageable.

I Example.

There is an annuity or rent of 20 s.per annum to endure 25 years, it is required what it is worth ready mony?

Look in the Table for 25 years, and right against it you shall find 10 li,13 s. 5 d. 3 q, which

is the folution.

2 Example.

What sixthe Leafe of certain Land valued at 140 li. per annum, to begin presently and endure

18 years, worth ready mony? Search in the Table for 18 years, the term

the faid Leafe paying no rent.

named in the question, and right against it toward the left hand you shall find 9 li-75-54-1q. which expresseth that one pound rent to be bought for that term is worth fo much; therefore that summe 140 times is the value required. Now 140 times 9 lil is 1260, and 140 times 7 s. is 980 s.or 49 li ; likewife 1260 140 times 5d.is 700 d. or 2 li-18 s-4 d. and 140 far-2--- 18things is 25-11d. all which added together make 1 312 li-1 s-3 d. for the value of 1312----

3 Ex-

fin

3 Example.

A Lease taken for 21 years at 13 li. 6 s. 8 d. per annum, which after 5 years expired, the Tenant is desirous to give a fine, and bring the rent down to 8 li. per annum, for the rest of the term, the demand is what fine is to be payed?

Subtract 5 years from 21, the remain 16, is the time unexpired: likewise from the present rent abate 8 li, the rest will be 5 li-65-8d, now the drift of the question it, what 5 li-65-8d, yearly rent or annuity to indure 16 years is worth present mony.

The value of 1 li. rent or annuity answering to 46 years is, 8 li-17 s-0 d. 1q. Now 5 times 8 li. 1s 40 li. and 5 times 17 s. 4 li. 5 s. and 5 times one farthing, is

1d-1 q. and because li. s d q
6s-8d. is \(\frac{1}{2}\) of 1 li. I 40-0-0

1 q; which is 2 li-19 s 2-19-1-1

od. all which added

together, make 4 li-47-4-1-1

4s-1d-q. which is the
fine that ought to be paid to bring the rent to
8 li. per annum.

X-

The fifth Table declaring what yearly rent or annuity of one pound ready mony will purchase for any number of years under 31, at 8 per centum, per annum.

years	li.	s. d	. g.	l .	H.	s.	14	9.	year
1	0	17	0	9.210	0	2	9	3	16
2	0	14.9	2	100	0	2	8	3	17
3	0	8	2	indra.	. 0	2	8	0	18
4 .	0	76	7 00		0	2	7	0	19
5	0	63	0	7	0	3	6	2	20
6	o	5 4		· Course	-	2	5	3	21
7	0	49	2	1	0	2	5	I	22
8	0	44	0	lo w	0.	2	4	3	123
9	0	40	0	1,0	0	2	4	I	24
10	0	38	2	41.501	01	2	4	0	25
II	0	36	0	1	0	2;	0	3	26
12	O	33	3	100	0	2	3.	f	27
13	0	3 1	3	L	0	2	3	0	28
14	0	3 9	I	1:	0	2	2	3	29
15	a.	2 1	10	1	0	12	2	2	30

In

In the fifth Table the Numbers and Columnes are all disposed as the former Tables, and needeth no further explanation but onely Examples.

I Example.

The Table declareth at first fight what yearly rent or annuity one pound ready mony will purchase for any term in the pale expressed.

But if the restant bove one pound, then if any value or rent set down in this Table, be multiplied by the number belonging to the years in question, the product will she what yearly rent or annuity that ready mony we purchase for the time proposed.

2 Example.

A certain man hath 750 listo purchase an Annuity to endure 27 years, so as it may yeeld him the like profit, as is more put-on according to the rate in the Table of resselled, as is required what that annuity are be?

Because the ann to endure 27 years, seek out the value the endure 27 years, in this fift Table, which is 25 q. now

Purchase of Annuities This being the Annuity of 20% ready mone will purchase for that plyed by 750 li. as fol- 75-0-0loweth, because & s. is 9-7-6 the tenth part of 20 s. 15-7therefore take the tenth part of 750 li. which is 85-3-75 li. which fet first down, then 750 times 3d. is 9 1. 7 s. 6d. which for under the former, last of all 750 farthin is 15 s. 7 d. ob. All waith added together, peduce 85 li. 3 s. 1 d. ob. the yearly Annual required, avog Acting the second times to the thorne Deo foli lass, omnis honor & gloria tribuatur. AMIN. Merale da the Becarde the on the feek out the value in this life Table, waten A